March 24, 1938

Paper Trade Journal

- Ruberoid Operating New, Wide Dry Felt Machine
- Automatic Control of Moisture and Basis Weight
- Report on West Coast Practice of Outside Chip Storage
- First Operation of New Asphalt Dispersing System

When

sman

s

re...

et the same, fine service for all grades of pulp

Through the Gottesman Organization, outstanding pulp producers everywhere supply you with Bleached and Unbleached Sulphite, Bleached Hardwood, Groundwood, Bleached, Semi-Bleached and Unbleached Kraft in the quality and quantities you must have for efficient production. And no matter what the grade of pulp, our service reflects over 70 years of experience in satisfying our many customers.

The Gottesman Organization

Established 1886

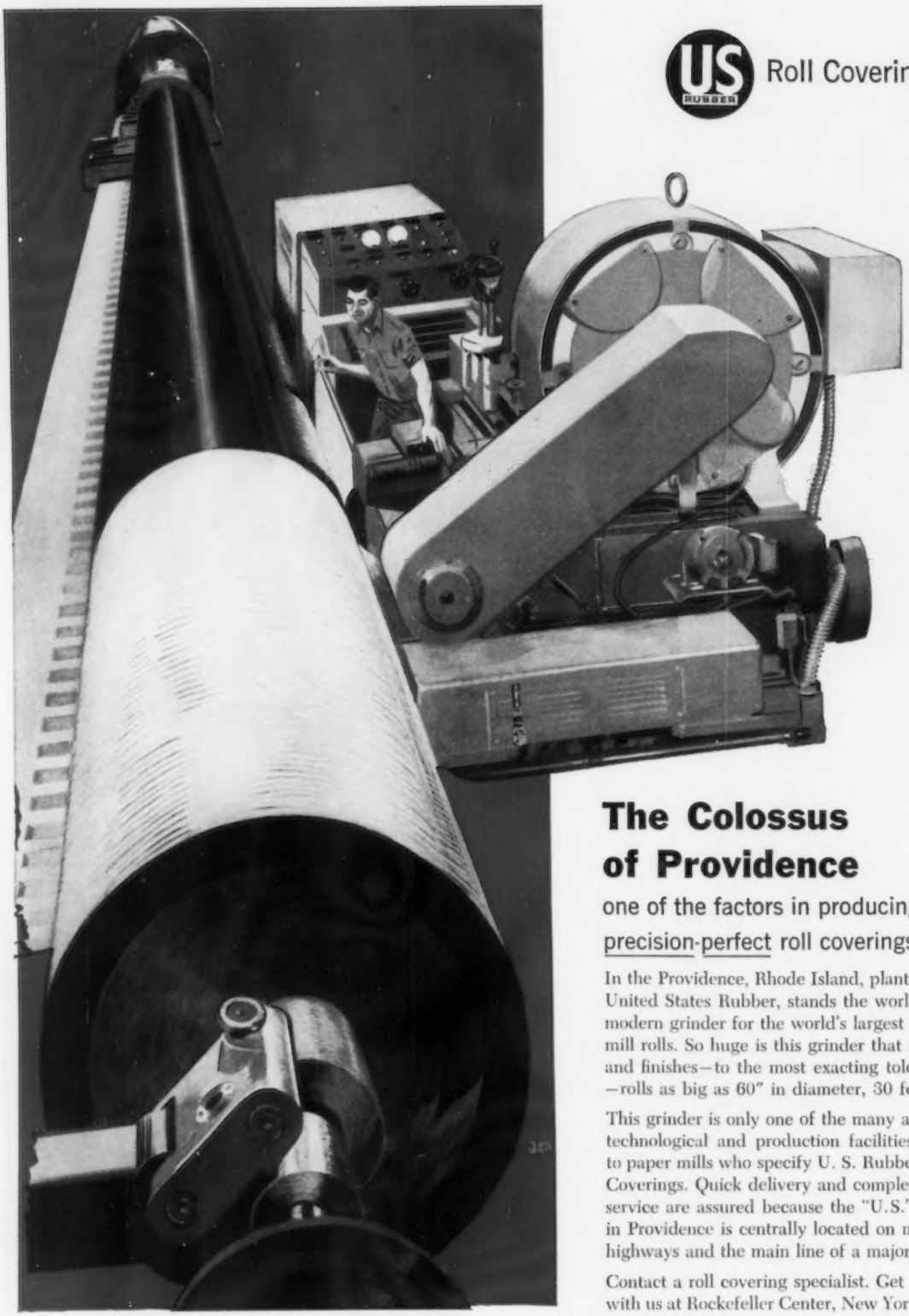
GOTTESMAN & COMPANY, INC. • CENTRAL NATIONAL CORPORATION
CENTRAL NATIONAL COMMERCIAL COMPANY, INC.
100 PARK AVENUE, NEW YORK 17, N.Y.

WOOD PULP G

PULP PAPER EXPORT CNC

Gottesman & Company Aktiebolag, Stockholm, Sweden • Central National-Gottesman Limited, London, England • Representatives in 55 Leading World Markets

University Microfilms
Att: E B Power
313 N First St.
Ann Arbor, Mich.



US Roll Coverings

The Colossus of Providence

one of the factors in producing precision-perfect roll coverings.

In the Providence, Rhode Island, plant of United States Rubber, stands the world's most modern grinder for the world's largest paper mill rolls. So huge is this grinder that it crowns and finishes—to the most exacting tolerances—rolls as big as 60" in diameter, 30 feet long.

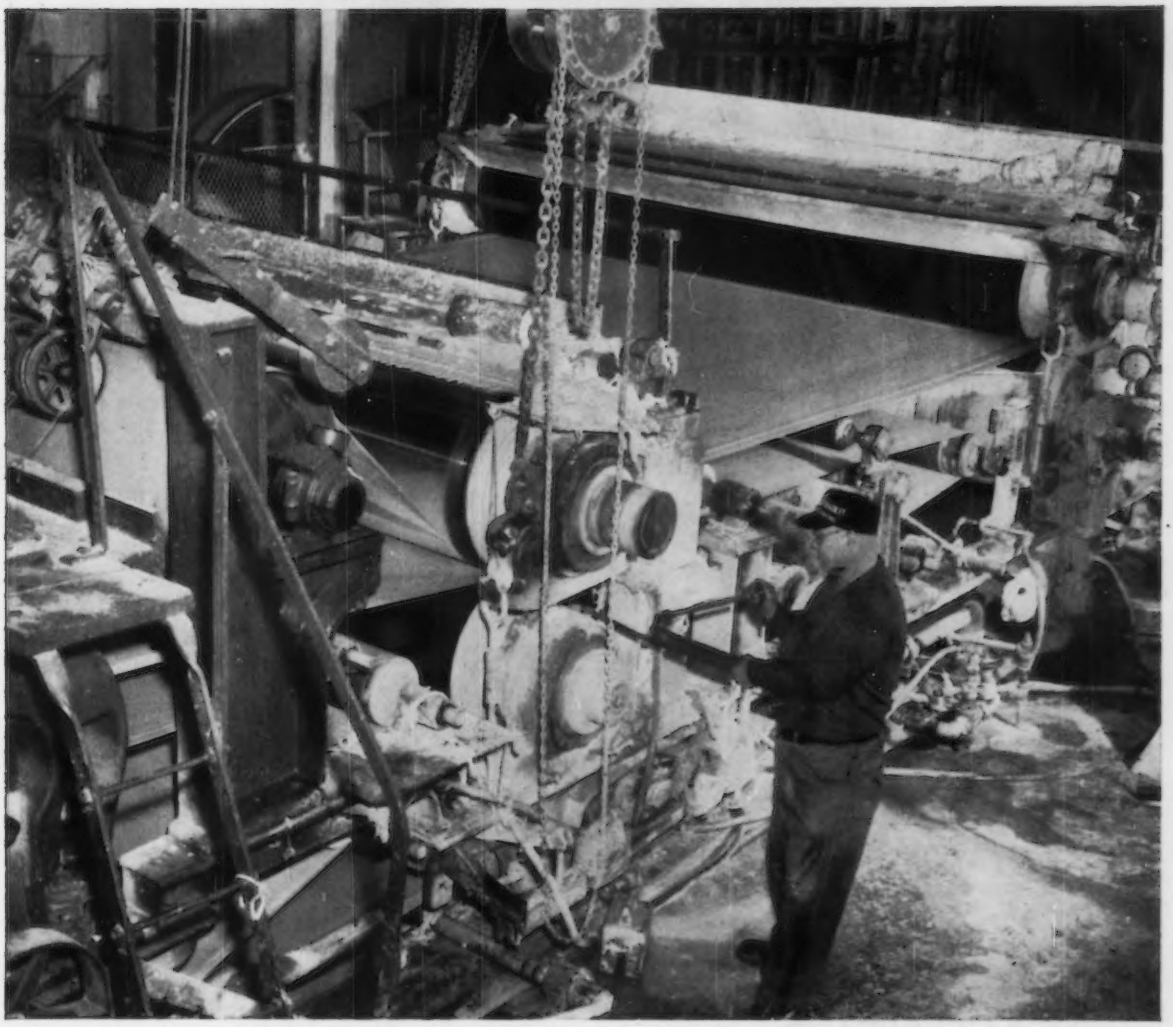
This grinder is only one of the many advanced technological and production facilities available to paper mills who specify U. S. Rubber Roll Coverings. Quick delivery and complete service are assured because the "U.S." factory in Providence is centrally located on major highways and the main line of a major railroad.

Contact a roll covering specialist. Get in touch with us at Rockefeller Center, New York 20, N. Y. In Canada, Dominion Rubber Co., Ltd.

Mechanical Goods Division

United States Rubber

B.F.Goodrich



Good water removal, long felt life with soft rubber top press roll

SEVEN years ago, the paper mill pictured above changed from the bonehard type of top press roll to something entirely different. It was a B.F. Goodrich roll they tried, made with a special *soft* rubber cover. They soon found that this resilient rubber roll gave them better water removal at high speeds, and much longer felt life.

The mill is getting better paper formation, too, with less shadow marking. That's because the special rubber cover on the roll is tough enough to stand years of use, yet soft so the roll presses perfectly without causing any crush marks to form in the tender stock.

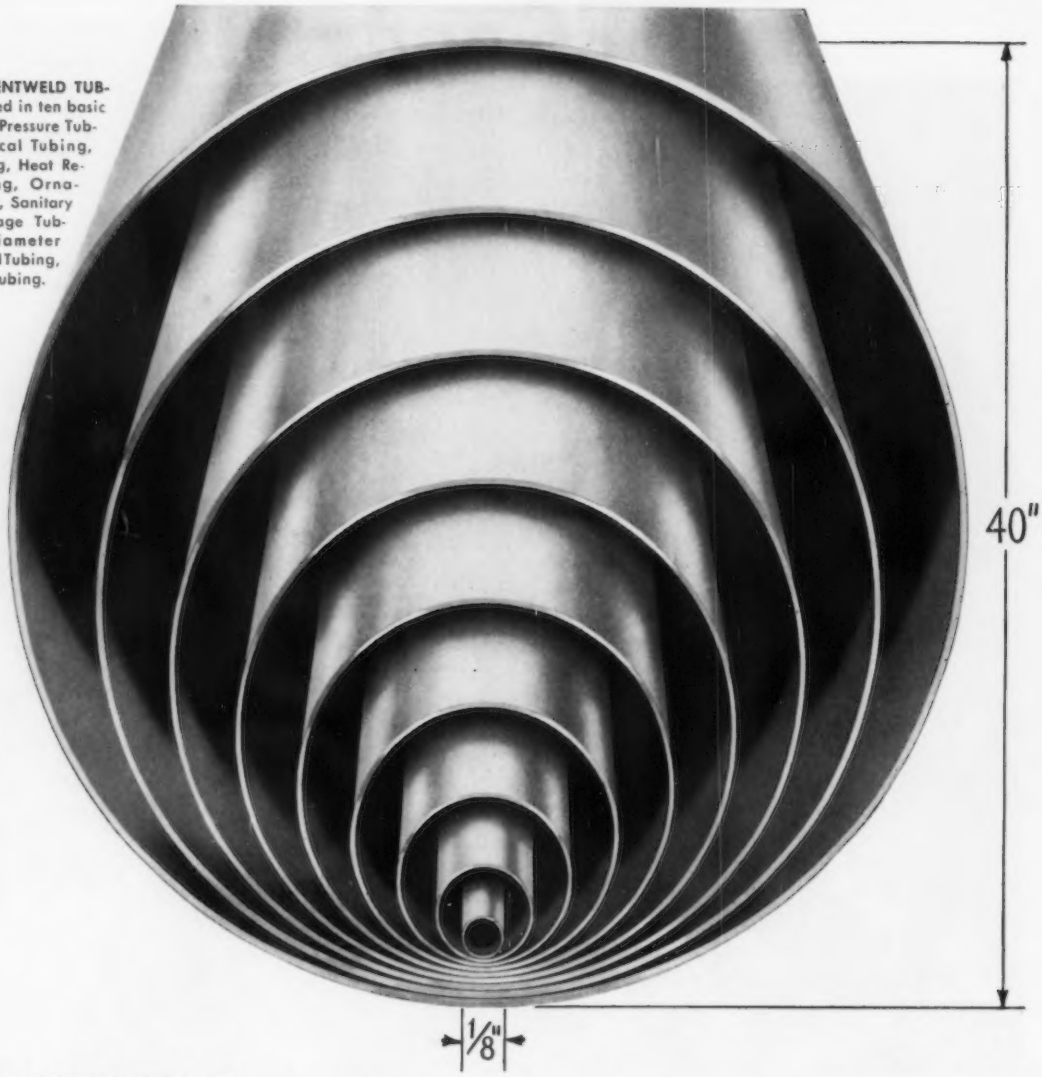
Another advantage of this soft rubber is that it does not pick fibers from the sheet. The B.F.Goodrich top press roll can be run directly on the sheet with practically every kind of paper stock except ground wood. On the machine shown above, the 7-year-old B.F.Goodrich roll helps turn out heavily-loaded sheets of sulphite bond, offset and mimeograph papers.

B.F.Goodrich makes top press rolls in a wide range of hardnesses to fit the job—from 20 plastometer to as soft as you might want them. Let a B.F Goodrich man show you how the improvements made in B.F.Goodrich paper mill rolls can improve the quality of your paper and save you money. *B.F.Goodrich Industrial Products Company, Dept.M-289, Akron 18, Ohio.*

B.F.Goodrich

INDUSTRIAL PRODUCTS

CONTOUR TRENTWELD TUBING is furnished in ten basic classifications: Pressure Tubing, Mechanical Tubing, Aircraft Tubing, Heat Resistant Tubing, Ornamental Tubing, Sanitary Tubing, Beverage Tubing, Large Diameter Tubing, Shaped Tubing, and Formed Tubing.



TRENTWELD tubing is equal in strength and has more uniformity than tubing made by any other method of manufacture

Trent offers tubing in sizes ranging from ⅛" to 40" O.D. and in a wide range of grades. These include: Hastelloy,* Zirconium, Zircaloy, Titanium and 19-9-DL grades. All are made by an exclusive welding process—Contour Trentweld®—which virtually eliminates the bead. Furthermore, by cold working and annealing after welding, Trent makes the weld equal in strength and corrosion resistance to the parent metal.

To insure that Trentweld tubing is of the highest quality attainable, a rigorous quality control program is carried out. Samples of each lot are tensile tested. Periodic tests — flattening, reverse bend, flare and flange, coil, and pressure — are conducted. Rigid corrosion tests are made on all lots intended for corrosive applications. When requested, a unique "single-wall" X-ray inspection is made as your final assurance of a sound, uniform product.

Why not take advantage of Trent *quality* when you order stainless or high alloy tubing? For further information, write for the Trent tubing handbook, Trent Tube Company, East Troy, Wisconsin.

*Trademark of Haynes Stellite Co.

CONTOUR TRENTWELD

TRENT TUBE COMPANY

Subsidiary of Crucible Steel Company of America

GENERAL OFFICES: EAST TROY, WISCONSIN
MILLS: EAST TROY, WIS.; FULLERTON, CALIF.

Published every Monday by Lockwood Trade Journal Co., Inc., 49 West 45th Street, New York 36

Phone: PLaza 7-2370

PAPER TRADE JOURNAL

Published Weekly Since 1872

March 24, 1958, *Vol. 142, No. 12*

JOHN C. W. EVANS
Editor

PAUL D. VAN DERVEER
Associate Editor

R. E. THUEMMES
Associate Editor

J. A. BROPHY
Managing Editor

ARTHUR KUDNER
Assistant Editor

LOCKWOOD TRADE JOURNAL CO., INC.

GEORGE E. LOCKWOOD.....President and Treasurer
ARTHUR E. GORDON.....Vice-President
FREDERICK E. WINKLER.....Secretary

Entered as Second Class Matter at the post office at East Stroudsburg, Pa., under Act of Congress of March 3, 1879. Publication Office at Lockwood Trade Journal Co., Inc., 34 North Crystal St., East Stroudsburg, Pa. Printed in U.S.A. Copyright 1958 by Lockwood Trade Journal Co., Inc. Paper established Feb. 17, 1899, combined with Paper Trade Journal Nov. 16, 1899. Paper established Sept. 21, 1910, combined with Paper Trade Journal February 19, 1926. All rights to the above titles reserved. Contents of Paper Trade Journal, including all articles, illustrations, etc., are copyrighted and may not be reprinted except by permission. Also publishers of Lockwood's Annual Directory of the Paper and Allied Trades.

REMEMBER THESE DATES

March 27-28: Annual Conference, Pulp and Paper Subcommittee, American Institute of Electrical Engineers, North Carolina State College, Raleigh, N. C.

March 31, April 1-2: National Paper Trade Assn. 55th annual convention, Waldorf-Astoria, New York.

May 14-16: TAPPI Coating Conference, Bedford Springs Hotel, Bedford Springs, Pa.

June 2-4: Technical Section, CPPA, Summer Meeting, Chateau Frontenac, Quebec City.

June 3-5: Superintendents' Assn. Annual Meeting Statler Hotel, Boston, Mass.

SUBSCRIPTIONS

United States	1 yr.	2 yrs.	3 yrs.
Paper and Pulp Mills, Converters, and Personnel	$5.00	$8.00	$10.00
All others	7.50		
U. S. Possessions and Canada	7.00	11.00	14.00
Latin American Countries	15.00	25.00	30.00
All other Countries	20.00	30.00	40.00

Single copy price of current issues:
North America 50c
Foreign $1.00

R. E. BOETSCH
Director of Circulation

TRENDS 13

NEWS BRIEFS

Union Bag-Camp Plans $30 Million Expansion .. 15
St. Regis Installs New Fourdrinier 15
Japanese Firm Starts Continuous Kraft Pulping .. 15

FEATURE ARTICLES

Ruberoid's Newest Dry Felt Machine 26
The A-B-C System for Moisture and Basis Weight Control 30
Storage of Chips in Outside Piles 40
Federal Paper Board First to Operate New Asphalt Dispersing System 47
Groundwood Bleaching 52

PAPER PEOPLE 19
NEWS OF CONVERTERS 21
PRICES 51
FIGURES OF THE WEEK 59
NEWS OF SUPPLIERS .. 61
OBITUARIES 62
CLASSIFIED ADVERTISING 66
ADVERTISERS INDEX .. 70

PAPER TRADE JOURNAL—49 W. 45th St., N.Y. 36, N.Y.
Please enter a subscription with the mailing address as follows:
Name .....
Address .....
City ..... Zone ..... State .....
If subscription is for an individual, please fill in:
Employer ..... City ..... State .....
Position ..... Employer's Business .....
Amount $ ..... ☐ Bill Me ☐ Bill Company ☐ Check Enclosed

Tests prove superiority of Huber Clays in concentrated clay-water systems

Today many mills are immediately slurrying their clay at high solids content upon arrival at the plant. Huber's Viscontrolled-clays are ideally suited to the needs of this trend.

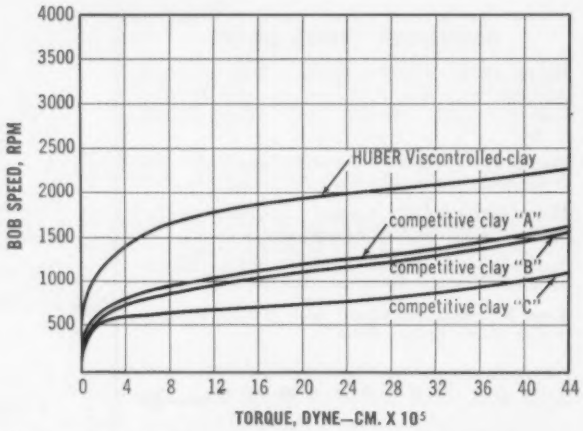
You can "make down" these dependable clays with lower power input than other clays demand. Or—you can process them at considerably higher solids content with the same power input.

These facts have been proved, using the Hagan High Shear Viscometer and particularly in actual plant operation. The rheograms shown below illustrate the low viscosity of Huber Viscontrolled-clay compared to competitive grades.

Huber VISCONTROL®—exclusive to Huber clays—makes possible the economical preparation of concentrated clay suspensions. Huber's continuing research program is designed to make life a little easier for you by adding the findings of modern science to the ancient and exacting art of papermaking.

Write us today for more information about Huber VISCONTROL.

Rheograms of 71% clay-water mixtures. Hagan High Shear Viscometer



Rheogram shows superior properties of Huber Viscontrolled-clays at high shear rates.

HUBER **J. M. HUBER CORPORATION** 100 PARK AVENUE, NEW YORK 17, N. Y.
Mines and Plants: Huber, Ga., Granitevill? & Langley, S. C.

THE BAUER BROS. CO.
1758 SHERIDAN AVE., SPRINGFIELD, OHIO

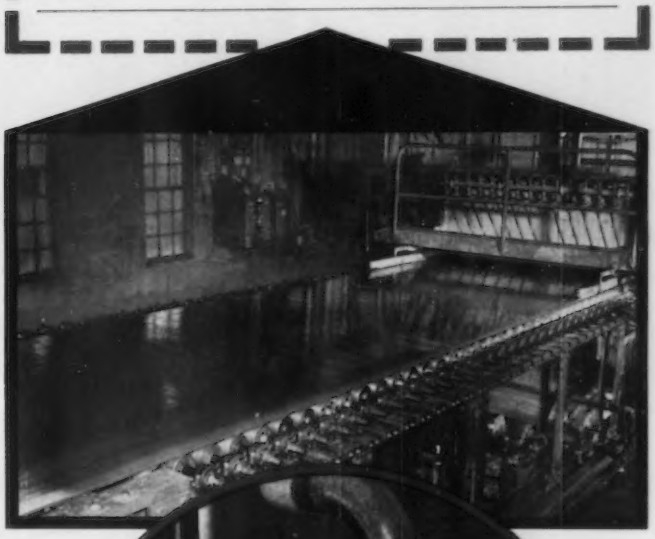
Send me the facts about automatic formation control.

NAME_____

TITLE_____

ADDRESS_____

Keep Your Best Formation on the Wire Automatically!



Bauer Pump Thru Refiner controlled by Couch Vacuum Does the Job

- Compensates for slight stock variations quicker than the best operators.
- Prevents over or under refining, corrects for hard or soft cooks.
- Has improved sheet formation within minutes after first start-up.
- Controls are simple, easy to maintain.

Write, wire or call for details.

Photos courtesy of Otsego Falls Paper Mills, Inc., Division of Menasha Wooden Ware Corporation, Otsego, Michigan

I tell you this is the best way to prepare stock for KRAFT PAPERS
You got rocks in your head... let me show you how you ought to do it!

But There's one thing they agree on:

YOU CAN DO IT BETTER with E.D. Jones

You may favor one way of preparing stock for kraft papers — the fellow in the next mill may be just as strong for another — even on the same type of furnish.

But whatever system you choose, you'll both find Jones quality equipment to fit it . . . and to help you produce better paper, more economically, and with a minimum of operating cost, maintenance, and down-time.

Only Jones is equipped to supply all types of stock preparation machinery . . . pulpers, beaters, disc and conical refiners, and screens.

So Jones is not limited to any one system. Whatever your stock preparation problem, you can count on your Jones representative for sound and unbiased recommendations, backed by Jones' reputation for quality and performance and more-than-a-century of paper mill know-how.

Ask your E.D. Jones man first...

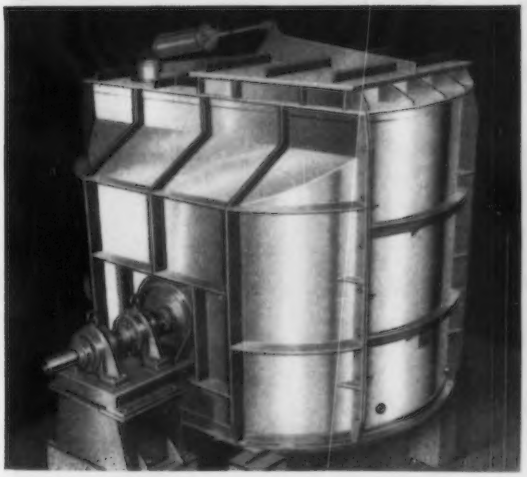
E. D. JONES & SONS COMPANY
Pittsfield, Massachusetts
BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

In Canada:
The Alexander Fleck, Ltd.
Ottawa

Export Agents:
Castle & Overton, Inc.
New York 20, N. Y.

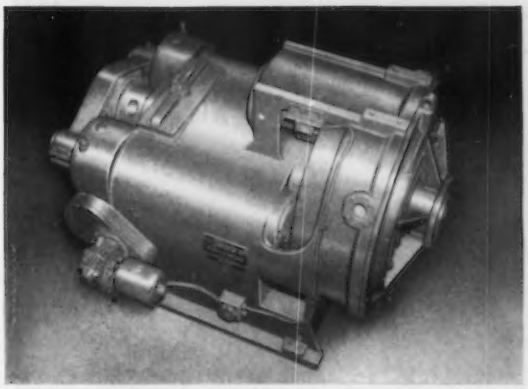
***Foreign Licensees:* FRANCE, Batignolles-Chatillon • SPAIN, Gabilondo**

E.D. Jones HI-LO PULPER



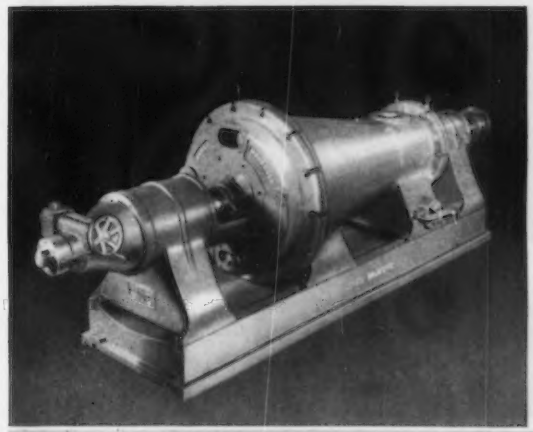
Engineered to eliminate the compromise imposed by conventional single-rotor pulpers between maximum circulation and complete defibering, the HI-LO employs two separately powered rotors to provide maximum pulping *and* complete defibering, with significant savings in time and power. For details, ask for Bulletin EDJ-1063.

E.D. Jones DOUBLE-D REFINER WITH DOUBLE EQUA-FLO EFFECT



The only unit of its kind with *two stages of refining* in one machine, the Jones Double-D can actually do twice the work of conventional refiners because it has double the refining area — 2200 square inches in the 42″ model; produces stock of equal or better quality at a considerable saving in operating cost. Ask for Bulletin EDJ-1083.

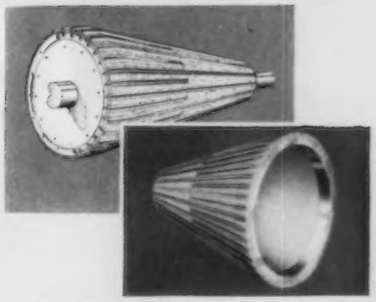
E.D. Jones MAJESTIC JORDAN



One of the most popular sizes in the Jones "family" of Jordans, the Majestic is second in size only to the Jones Leviathan. It offers efficient use of horsepower in quantity production, a wide range of tackle and a choice of handwheel, worm gear or Accru-Set® controls.

All Jones Jordans have split small heads and self-contained bearings for quick, easy dismantling and reassembly.

REVOLUTIONARY ADVANCE In Jordan Plug Design

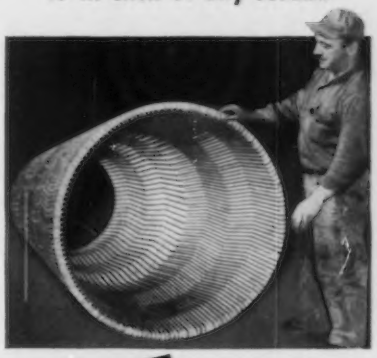


In addition to the strongest and most adaptable solid plug ever developed, Adapta-Plug is available in sleeve form for easy, economical conversion of old worn plugs.

E.D. Jones Adapta-Plug

Completely bandless, easily stripped and filled. Inverted-wedge-type slots hold bars firmly in place, eliminate hazards of slot wear and corrosion. Any desired edge available. Write for Bulletin EDJ-1094.

Complete ONE-PIECE assembly to fit shell of any Jordan



E.D. Jones FULBAR SHELL FILLINGS

Ideal filling for any Jordan, new or old, of any make. No keys or wedges needed. Easy to grind in. Many other advantages. Write for Bulletin EDJ-1094.

E. D. JONES & SONS COMPANY

Pittsfield, Massachusetts

Builders of Quality Stock Preparation Machinery

In Canada: The Alexander Fleck, Ltd., Ottawa

ITALY, de Bartolomeis • JAPAN, Mitsubishi

Thiele Kaolin

water-washed
spray-dried
COATING CLAYS

- EXCELLENT COLOR
- HIGH BRIGHTNESS
- UNIFORM LOW VISCOSITY
- UNIFORM LOW MOISTURE CONTENT
- UNIFORM LOW SOLUBLE SALT CONTENT

UNLIMITED RESERVES

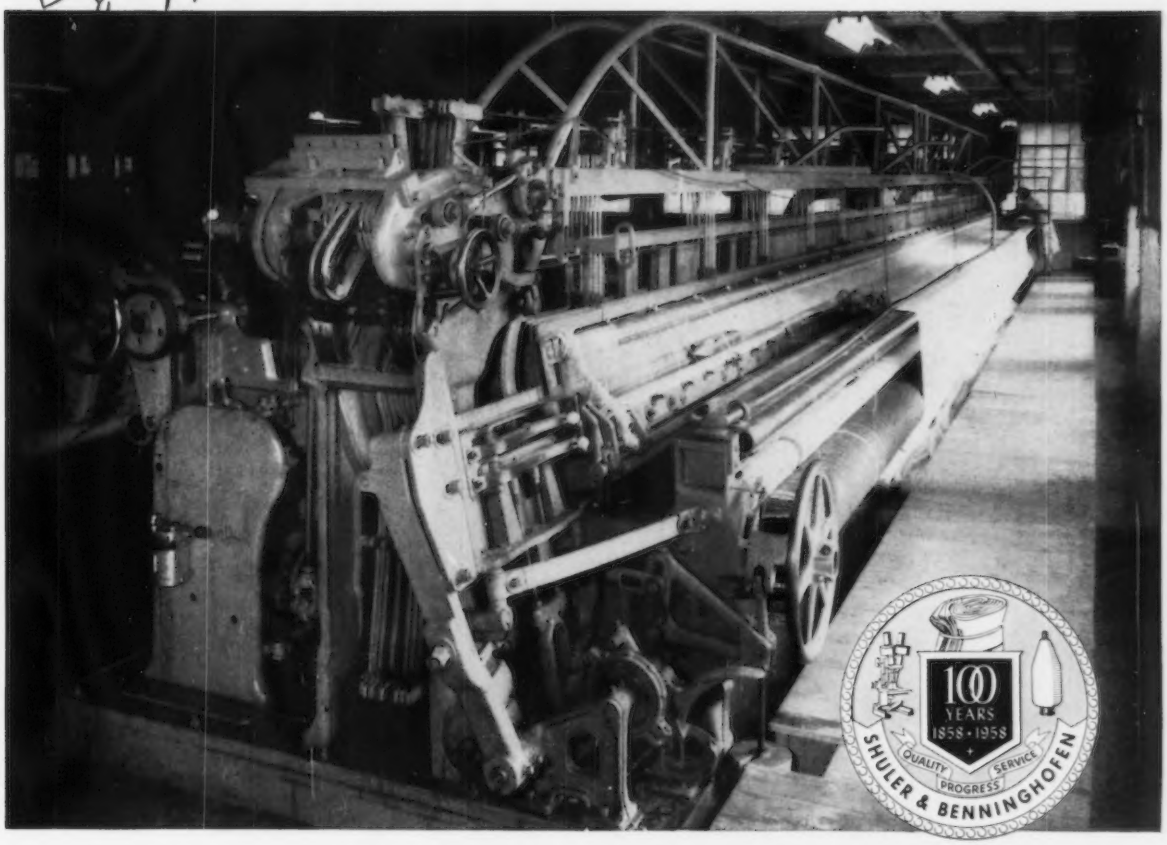
Write for full information and sample of Thiele Kaolin coating or filler clay for your particular use.

Thiele Kaolin Company

P. O. BOX 270 • SANDERSVILLE, GA.

HAM FELTZ explains:

"Why a 100 Year Old Company Buys The Biggest Loom in America."



"MANY A 100 year old company
may like to sit on its laurels
and keep producing as it did in the past

But NOT the makers of Hamilton Felts !

"They've just installed this new giant loom
with a reed space of 726 inches
—the widest felt loom, we believe, in America.
Now Hamilton Felts can be produced
to meet the needs of all board and paper mills
which may require felts not only of
unusual qualities* but unusual measurements.
It's no wonder that, after 5 generations
you can't beat Hamilton Felts."

**"If you have a problem in paper or board making that one of our 300 proven styles won't solve, we will be happy to design a felt that will. Why not talk it over with your Hamilton Felt Service Salesman—or write us direct—today?"*

YOU CAN'T BEAT
Hamilton
FELTS

SHULER & BENNINGHOFEN
HAMILTON, OHIO • *Fine Blankets Since 1858*

NEW! direct tank-mounted LIQUID LEVEL TRANSMITTER

Exclusive static pressure connection for closed vessels above or below atmosphere . . . eliminates need for second instrument.

This sensing diaphragm capsule flange-mounts directly on side of tank. All wetted parts of Type 316 stainless steel, with optional plastic coating for further corrosion protection.

with DIRECT 3-15 psi air output signal

IDEAL FOR: Blow tank level – Brown stock washer filtrate tank level – Stock level and seal boxes – any pulp or paper mill fluid

Now you can measure the level of any "difficult" or easy-to-measure fluid — economically, without the complication of floats or bubble tubes, and with *sustained high accuracy over the entire range span.*

Flange-mounted directly to the side of an open or closed tank, the Type 13FA Transmitter eliminates piping and purging. Its stainless steel diaphragm capsule senses level changes instantly. Conventional tubing leads its output air signal directly to standard 3-15 psi receiver-recorders and controllers without need for intermediate signal converters.

Wherever level measurement is a problem, the 13FA provides an accurate, trouble-free solution. Write for detailed information, or ask your nearby Foxboro Field Engineer to explain its application to your specific process. **The Foxboro Company, 233 Norfolk St., Foxboro, Mass., U.S.A.**

FOXBORO
REG. U.S. PAT. OFF.

LIQUID LEVEL TRANSMITTERS

TRENDS

MARCH 24, 1958

Pulp Price Outlook

Prospects now are that there will be no change in pulp contract prices for the next quarter, starting April first. If there should be any change the most likely candidate is unbleached sulphite —downward; and possible, but even less likely, is a drop in unbleached kraft. Scandinavian pulp prices to European customers have been reduced but it is thought unlikely that these producers will lower their North American prices.

More on Outside Chip Storage

Lee Eberhardt proposed in a recent article in this magazine that Eastern and Southern mills investigate the possibility and economics of storing wood outside in chip rather than log form as is often done in the Pacific Northwest. As a follow-up to this idea we present an article in this issue which discusses West Coast practices and findings on outside chip storage.

Rayon Yarn Shipments Down

Shipments of rayon and cellulose acetate yarns and staple in February dropped 15% over January and were off 19% from February of last year.

What's in a Name, For Pulp That Is

The problem of systematizing the names of different types of pulp and pulping processes is one that gets more pressing. Paper Trade Journal in the past has tried to spur some action on this without success. The problem becomes more involved and acute. The proper organizations to take action on this would seem to be the U.S. Pulp Producers Assn. or TAPPI. A subcommittee of the latter has had this problem before them for a good number of years but have made no public report on the subject as yet.

Corrugated Box Sales Off Little

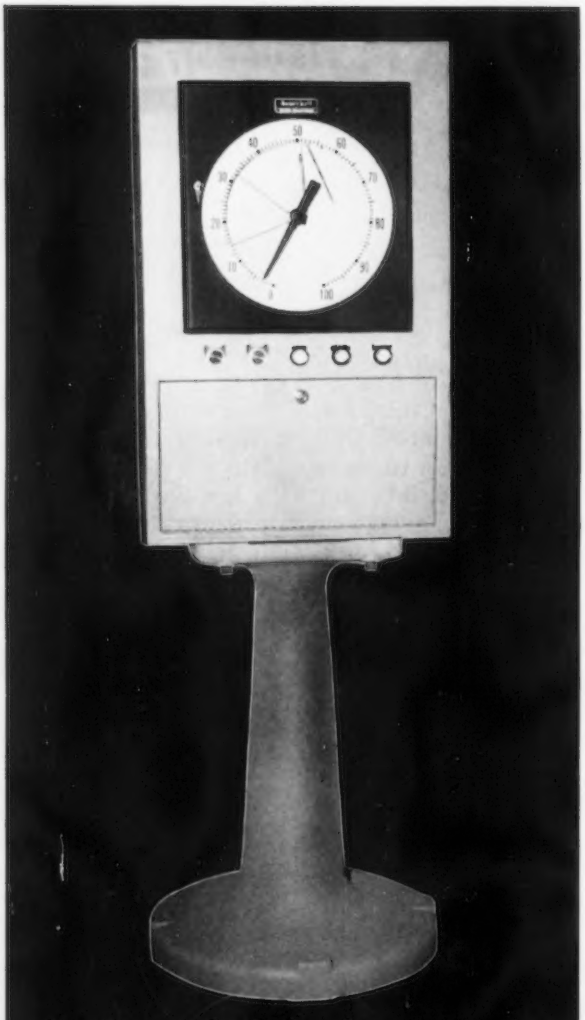
Corrugated box shipments for the first two months of this year were only off 3% from same period in 1957.

February Building Starts Down

The annual rate of private home construction in February, according to the Dept. of Labor, was at its lowest level since 1949. February usually marks the beginning of a seasonal upturn in home building but builders report that operations were delayed by an abnormal amount of rain and snow and the unusually low temperatures that prevailed during much of the month.

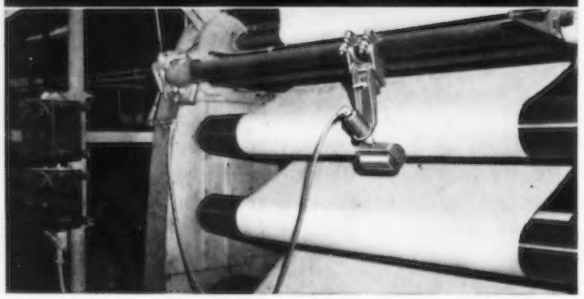
More Business Pictures

Industry production in February was at the same level as December '54. Total personal income in February was below January but well above February 1957.



The New *Moist-O-Graph:*

- ★ Can be installed in any convenient location—out of the way of other equipment.
- ★ Delivers accurate, continuous record of sheet moisture deviation.
- ★ Chart and scale evenly graduated from 0—100.
- ★ Can be used for most types of paper and board regardless of furnish and moisture requirements.



The ***Moist-O-Graph*** system can be equipped with a selector switch permitting the use of additional detector rolls to aid in checking wet streaks. When the instrument is used with a coater or other converting machine, as shown above, a single detector roll is usually adequate.

The new *Moist-O-Graph*

simplifies measurement of sheet moisture

- ***Prevents waste***
- ***Improves quality***
- ***Aids production***

The new *Moist-O-Graph* takes the guesswork out of sheet moisture measurement. It assures continuous production of paper with optimum moisture characteristics. This instrument is applicable to paper coating and all types of paper making. In scores of mills it has proved its ability to increase quality, decrease off-grade losses, and help keep production rolling.

The *Moist-O-Graph* is simpler in construction and more accurate than ever. New design adds the most modern engineering techniques to basic operating principles that have proved themselves over many years of application. Simplified construction eliminates most maintenance. Fewer spare parts are required.

Call your nearby Honeywell sales engineer for details. He's as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.

MINNEAPOLIS
Honeywell
BROWN INSTRUMENTS
First in Controls

Union Bag-Camp Borrows $30 Million

Union Bag-Camp Paper Corp. has arranged a $30 million loan with the Equitable Life Assurance Society of the United States payable in instalments over the years 1963 to 1978, inclusive.

The proceeds, to be received in three instalments of $10 million on October 1, 1958, March 2, 1959 and September 1, 1959, will be used in connection with the corporation's plant expansion programs at Savannah, Ga., and Franklin, Va.

Allied-Albany Mill to Resume Operation

Allied-Albany Paper Corp.'s mill in Albany, N. Y., shut down about a year ago, will resume operations in mid-April, producing industrial towels and tissue under new owners. It will employ about 100 men.

Announcement that arrangements have been made to purchase the mill were made by the buyers, Steiner Paper Mills, Chicago, Ill., a division of Steiner Co., of Chicago.

Paul Jespersen, vice president of Steiner, said in Albany that the mill will have to be converted in order to produce towels and tissue.

Scholarships and Summer Jobs Available in Pulp and Paper

The North Carolina State College Pulp and Paper Foundation announces a number of scholarships available to high school seniors interested in following a career in pulp and paper technology. Major scholarships to be awarded have a value of $500 per year to residents of North Carolina or $750 to residents of other states. Minor scholarships have a value of $300 a year irrespective of residence. Winners of these scholarships are virtually assured of summer jobs within the pulp and paper industry which would pay them more than enough to carry the college expenses for a full year over and above that covered by the scholarship. A student under one of the scholarships working at one of the Foundation's member mills for three months during the summer could expect to earn approximately $800 to $1000.

The financing of the scholarships is made possible by membership fees and donations by members of the Pulp and Paper Foundation, Inc. This organization is made up of large pulp and paper mills and paper mill supply organizations who are vitally interested in the development of the pulp and paper industry in the South.

Any high school graduate or college student in the United States may apply for one of these scholarships. His qualifications are determined by considering together high school academic records, extra curricular achievements, financial needs, and results of college entrance examinations. Applicants for these scholarships must be prepared to take the College Entrance Examination Board Scholastic Aptitude Test to qualify them for admission to N. C. State College.

This college entrance examination will be given at various localities during the spring. Full details may be obtained by prospective freshmen from their high school vocational counselors. For scholarships and admission applications, interested high school seniors should write to Dean R. J. Preston, School of Forestry, N. C. State College, Raleigh, N. C. The final date for scholarship application is May 15, 1958.

Japanese Firm Starts Continuous Kraft Pulping

The first Pandia Chemi-Pulper system for continuous production of kraft pulp in Japan, recently went into production at the Nikko Mill of Takasaki Seishi K.K. (Takasaki Paper Manufacturing Co.) near Utsunomiya, north of Tokyo. Manufacturing a high-yield pulp for kraft liner board, the new mill is producing 120 metric tons per day of kraft pulp from beech and Japanese pine pulpwood.

This continuous kraft pulping system, with its several advantages over traditional batch pulping, will also be utilized by Takasaki to produce a somewhat finer grade of pulp for the manufacture of kraft paper.

Mr. Yohitoshi, vice president of the Takasaki firm and one of Japan's top experts in kraft pulping, and K. Takeuchi, managing director of the company, supervised the start-up of the new continuous system, with technical assistance from Pandia service engineer, David Morton. Supplied by Black-Clawson Co., Pandia Division, Hamilton, Ohio, the Pandia Chemi-Pulper system consists of a 15-inch screw feeder, four 42-inch diameter digester tubes with recirculation, and a 28-inch discharger. Disk refiners, pulp washers, and high speed rotary screens complete the pulp mill.

New Fourdrinier Installed at St. Regis

One of two major paper making machines of the St. Regis Paper Co., Bucksport, Maine, was shut down for three weeks to permit the installation of a new fourdrinier.

The machine will be capable of a maximum output of up to 1800 feet a minute. Previously, the machine produced between 900 and 1200 feet of paper a minute.

The new fourdrinier was built by Rice Barton Co., Worcester, Mass. St. Regis officials placed the cost of the new installation at well over a million dollars.

In addition to the installation of the fourdrinier, the company also plans to install a new drive motor on the dryer section. They will also move the winder to provide more space and will install a new winder tension control.

Bowaters Acquires 500 Acres from TVA

East Highlands Co., a subsidiary of Bowaters Southern Paper Corp., has purchased 10 tracts of Tennessee Valley Authority property on Norris Lake for $27,000.

A Bowaters representative said the land, purchased at public auction, will be used as a tree farm to grow the southern pine which the firm uses in its paper production plants at Calhoun, Tenn.

The tracts, in Campbell County, include about 500 acres.

I.B.M. Takes Option On Site for Punch Card Plant

The supplies division of International Business Machines Corp. has obtained an option on 1¼ acres of land in Concord, Mass. William B. McWhirter, general manager of the supplies division, said that I.B.M. intends, with approval of town authorities, to build a punched card manufacturing plant which ultimately would employ about 30 people.

The land being considered is situated in the West Concord section of the town, in an industrial zone adjacent to the main line of the Boston & Maine Railroad.

Summer Course Set for Lowell

A summer course in Paper, Its Properties and Uses again will be given at Lowell Technological Institute's Department of Paper Engineering this year under the joint endorsement of the Boston Paper Trade Assn. and the New England Paper Merchants Assn. Course dates are June 16 through 27.

Purpose of the course is to present in a practical way information about papermaking and the properties of paper in order to determine the value and suitability of paper and paperboard for various end uses. The program is divided into two group activities after a common first week; the division is on a basis of interest in "fine" or "coarse" papers.

Enrollment for the course is limited, and applications will be accepted as received. Fee for the course including tuition, room, meals, books, and transportation on field trips is $225. Students living within commuting distance of Lowell are invited to attend while living at home. Their attendance is required at the evening group discussions. The fee is $150 for such commuters.

Applications should be sent before May 18 to Prof. John Lewis, Director of Paper Summer Course, Lowell Technological Institute, Lowell, Mass.

Nomenclature and Sulphite Pulping

Dear John:

We would like to commend Professor R. L. Janes for his attempt to bring some order into the chaos of current pulp nomenclature (*Paper Trade Journal*, 142, No. 8: 44, Feb. 24, 1958), but we are sorry to see that he perpetuates the confusion that has been caused by the use of the term "bisulphite" for the regular sulphite cook. We believe "acid sulphite" would be much better, especially since "bisulphite" should be reserved for processes such as our Arbiso cook, where the liquor is a solution of true bisulphite, containing no excess SO_2. (See *Paper Trade Journal*, 142, No. 7: 23, February 17, 1958).

The use of different names for pulp produced by the same process with different degrees of treatment seems to be a weak point; thus "groundwood from chips" becomes "chemi-mechanical (cold caustic)" and finally "cold caustic semichemical" as the yield declines. It would be clearer to use the same name in all three cases and recognize the fact that the basic process is the same, but that the extent of chemical treatment puts the final pulp into different class. It would also be most desirable to find a less cumbersome name for groundwood from chips and leave the term "chemi-mechanical" to the special process to which it was first applied. We use "refiner groundwood," which can readily be abbreviated to "R. G."

Since our company was one of the first to develop high-yield sulphite for newsprint, some corrections to the description of that process may be in order. We have had no trouble in blowing the chips up to 65% yield (with lime-base liquor), but one mill is now cooking regularly to 70% yield in the long-cone digester. It is true that refiners and some other equipment must be added, but since all new equipment in a sulphite mill is likely to be stainless, we deprecate the emphasis on that point. As to pitch, it is less troublesome rather than more. Obviously the same amount of pitch from the wood is going to be distributed over more fibre and, therefore, the percent pitch and its effect in paper making will be less. The mills have found that the high-yield fibre replaces the conventional sulphite weight for weight.

Sincerely,

Rodger M. Dorland
Director of Research
Abitibi Power & Paper Co.

Editor's Note—Everyone agrees on the need for an improved pulp nomenclature system, but so far no one will agree on a new system. A TAPPI committee has been working on the problem for more than five years without producing a recommendation. The editor must share with the author any criticisms of the nomenclature in the article referred to since he had a hand in it.

Paper and Board Production

According to the American Paper and Pulp Assn., the ratio of the United States production to mill capacity for the week ending March 8, 1958, was 87.9 per cent compared with 89.8 per cent revised for the preceding week. The ratio was 97.6 per cent for the corresponding week a year ago.

The paperboard production ratio for the week ending March 8, 1958, was 87 per cent compared with 86 per cent for the preceding week and 95 per cent for the corresponding week last year.

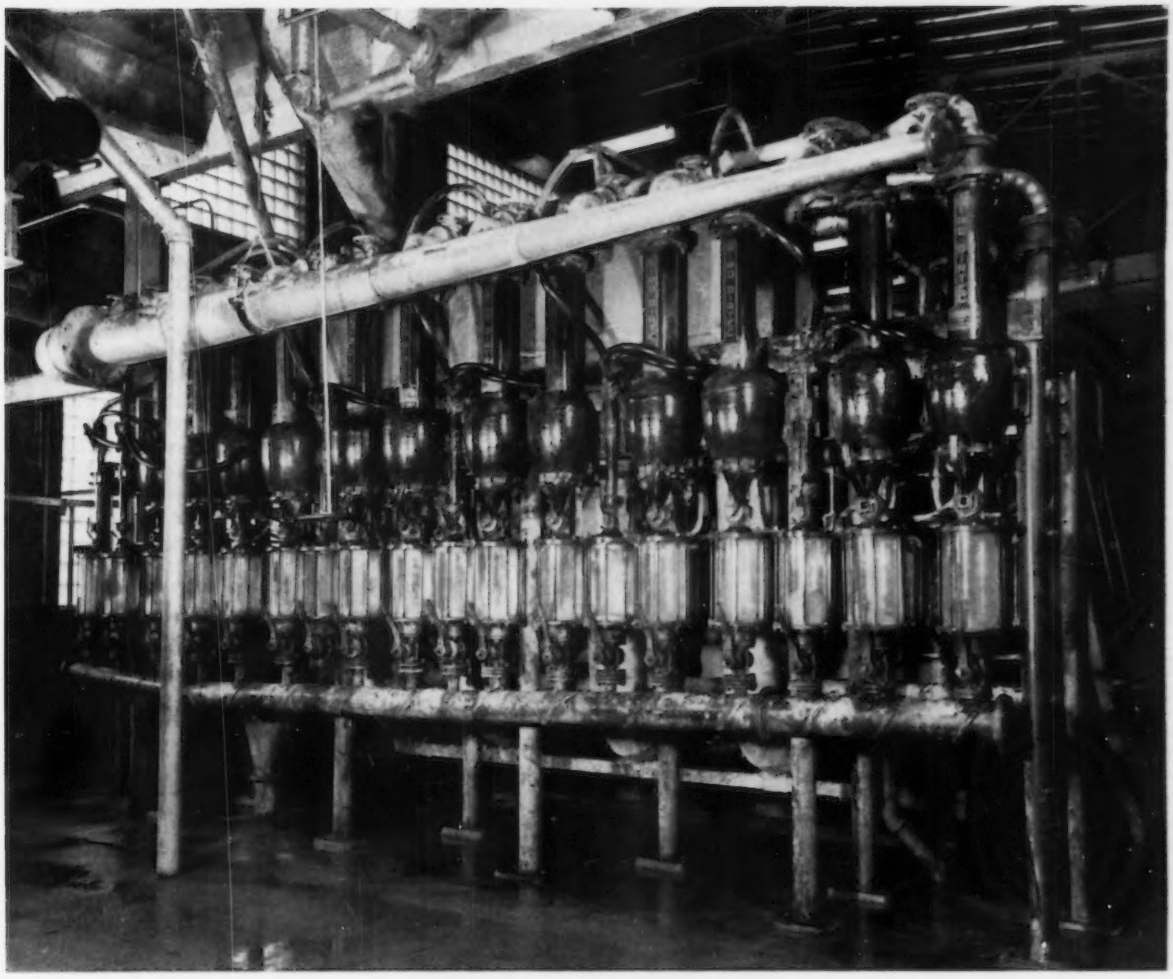
(Detailed statistics on page 59.)

Canadian Keyes Acquires Broader Rights

Canadian Keyes Fibre Co., Ltd., Hantsport, Nova Scotia has recently completed a new license agreement with Keyes Fibre Co. of Waterville, Maine, under which the Canadian firm has acquired rights to manufacture all of the Keyes products in Canada.

An agreement between these two firms has been in existence for many years but was limited as to the products which could be manufactured and sold in Canada. The new agreement, much broader in scope, will permit expansion of the Canadian company and greater diversification in its operations.

Canadian Keyes has completed a 35,000 sq. ft. addition to its plant. Additional pulp molding equipment is scheduled to be in operation in the fall.



Dirtecs Provide Low Cost Protection Against Damaging Dirt and Grit

On all kinds of paper, pulp and board stocks, Dirtecs protect against those abrasive particles of dirt and grit that can hurt paper quality and damage machine wires and roll surfaces.

Dirtecs deliver clean stock in full volume without mixing any of it with the rejects. They are easy and economical to install, operate and maintain. They come in regular or *king* size to handle any volume.

Ask for recommendations, layouts and estimates

BIRD MACHINE COMPANY

SOUTH WALPOLE, MASS.

REGIONAL OFFICES: EVANSTON, ILLINOIS
PORTLAND, OREGON • ATLANTA, GEORGIA

Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

Plant to Locate in Narrows, Va.

A tissue and toweling converting plant will open in Narrows, Va. about April 1. The new plant is a branch of Peavey Mills, Ladysmith, Wis.

Paper towels, napkins and tissues will be manufactured under the brand names of "Sail" and "Como."

N. E. TAPPI Celebrates

The New England Section of the Technical Association of the Pulp and Paper Industry will celebrate the 25th anniversary of its founding on April 11, at the Roger Smith Hotel, Holyoke, Mass.

The formal program will begin at 4:30 p.m. with a paper titled "A Survey of Machine Coating Method" by G. L. Booth, Black Clawson Co., Fulton, N. Y. Entertainment and dinner will follow. P. S. Bolton, Continental Can Co., Uncasville, Conn., will reminisce on "Characters I Have Met."

St. Regis Confers Safety Awards

St. Regis Paper Co. announces that its company-wide award for the most outstanding safety achievement of the year has been won by its Kansas City, Mo., multiwall bag plant. The plant completed operations in 1957 without a lost time injury.

Divisional safety awards for 1957 were also conferred on six other St. Regis plant locations. The machine shop at Emeryville, Calif., won the Machine Division annual safety award for the second consecutive year, with a perfect no lost time injury record.

The Printing Paper Division annual safety award went to the Bucksport mill with 1,666,079 man-hours completed and only seven lost time injuries.

The Tacoma, Wash., mill won the Kraft Pulp & Paper mill annual division safety award with only six lost time injuries while working 1,097,027 man-hours.

Awards were also given to the Southern Woodlands Division at Jacksonville, Fla., and the Panelyte Division at Kalamazoo, Mich. The Muskingum Fiber Products Division at Coshocton, Ohio, winner of the newly-etsablished Container Div. annual safety award, completed 1957 without a lost time injury.

Bergstrom Museum

The John N. Bergstrom home in Neenah, Wis., will be converted into a museum and art center, under terms of the will of the co-founder of the Bergstrom Paper Co. Mr. Bergstrom also left the city $50,000 for establishment of the museum.

Canadian Woodpulp Production off in Jan.

Canadian woodpulp production was off in January owing in part to a work stoppage in the industry's West Coast mills and in part to lower levels of demand at home and abroad. Output for the month was 752,258 tons as against 882,609 tons last year. The western mills, which were closed for the entire month, generally produce some 80,000 to 90,000 tons of pulp a month.

Chemical pulp output in January was 314,895 tons as compared with 395,466 tons a year ago. Mechanical pulp production for the month was 432,116 tons this year as against 480,211 tons in 1957.

Domestic pulp consumption in January was 614,105 tons this year as against 685,519 tons a year ago. Exports for the month were 128,049 tons this year and 179,133 tons in 1957.

Program Details for Coating Conference

Program Chairman Emil Padavic has released details of program for the ninth TAPPI Coating Conference. The conference has been planned to include five technical sessions in the program, two which will take the form of featured panel discussions. The theme of this year's conference is "Coating Formulations". The two panels scheduled are on Coating Formulations and on Practical Rheology. The formulations panel will be moderated by Frank Kaulakis, chief coating development, Consolidated Water Power and Paper Co., Wisconsin Rapids, Wis. Harris O. Ware, technical manager, Beveridge Paper Co., Indianapolis, Ind., will be the moderator of the panel on "The Practical Aspects of Rheology as Related to the Coating of Paper and Paperboard".

Local arrangements chairman for the conference is John Lohnas, West Virginia Pulp and Paper Co., Luke, Md., and C. G. Landis, American Cyanamid Co., is coordinating the activities of the various committees as General Conference Chairman.

The Coating Conference will be held at the Bedford Springs Hotel, Bedford, Pa., on May 14, 15 and 16.

The papers and panels are as follows:

"A Simple Laboratory Device for Studying the Trailing Knife Process," by G. W. Jones and D. W. Quackenbush, Weyerheuser Timber Co., Longview, Wash.

"Use of CMC as a Coating Adhesive," by Harry Kohne, West Virginia Pulp & Paper Co., Luke, Md.

"Elimination of Tracking in Paper Coating Lays," by Dexter L. Wolfe, Kimberly-Clark Corp., Neenah, Wis.

"The Dispersion of Pigments for Coating Colors: Concept and Theory," by J. V. Robinson, Mead Corp., Chillicothe, Ohio.

"Progress Report on an Investigation of the Fundamental Factors Determining Coating Color Viscosities," by Victor F. Mattson and James R. Leighton, Oxford Paper Co., Rumford, Me.

Panel on Coating Formulations, Moderator: F. Kaulakis.

"Basic Properties of Pigmented Paper Coating Utilizing Dow Latex 512-R, Isolated Soya Protein, Casein, and 512-R/Protein, 512-R/Casein Adhesives," by R. L. Errott, R. G. John, L. H. Silvernail, Dow Chemical Co.

"The Application of Statistical Analysis to Some of the Variables Affecting the Flow Properties of Paper Coating Colors," by Robert C. Chase, University of Maine.

"An Application of the Kubelka-Munk Theory to Coated Paper Brightness," by R. W. Hisey and H. W. Cobb, S. D. Warren Co., Cumberland Mills, Me.

"Effect of Pigment Volume Concentration on Coating Properties," by W. R. Willets and F. R. Marchetti, Titanium Pigments, Corp.

"Polyoxyalkylene Glycols in High Solids Colors," by A. Damusia, C. Leaf, and J. W. Compton, Wyandotte Chemicals Corp.

"Use of Ultra-Fine (Mistron) Talcs for Pigmentation of Boxboard Coatings," by R. S. Lamar, Sierra Talc Co., S. Pasadena, Calif.

"Comparison of Anatase and Rutile Titanium Dioxides in Paper Coatings," by F. C. Schmutz, New Jersey Zinc Co., Palmerton, Pa.

"Dispersion of Calcium Carbonate Pigments," by G. D. Hansen, Calgon, Inc., Pittsburgh, Pa.

"The Effect of Instrumental Variables Upon the Observed Flow Properties of Paper Coating Clays," by G. Hemstock and C. Alberts, Minerals & Chemicals Corp., Menlo Park, N. J.

"Determination of Filler and Coating Pigments in Paper by X-Ray Techniques: I. Identification," C. L. Garey, E. J. Jones, and J. W. Swanson, The Institute of Paper Chemistry, Appleton, Wis.

"Report on TAPPI Project 600; The Effect of Pigment Combinations and Coating Solids on Particle Packing and Sheet Characteristics," by Project 600 Sub-Committee.

Panel: The Practical Aspects of Rheology as Related to the Coating of Paper and Paper Board. Moderator: Harris O. Ware, Beveridge Paper Co.; R. N. Thompson, Calgon, Inc.; Hugh Lavery, International Paper Co.; A. C. Zettlemoyer, Lehigh University.

PAPER PEOPLE

John Aull Jr. Ends Service with Sorg

John A. Aull Jr., long an executive of the Sorg Paper Co., has stepped down as senior vice president and treasurer of the company to make his home in Honolulu, Hawaii. He will remain a member of the board.

Mr. Aull has been senior vice president and treasurer of Sorg since 1956. He has been associated with the company since 1938, and formerly was president of Sorg Pulp Co., Ltd., Canada, a wholly-owned subsidiary of the company.

Directors of Sorg Paper Co. then elected J. E. Shirley to succeed J. A. Aull Jr. as treasurer of the company.

Mr. Shirley, who was vice president and controller, was elected vice president of finance and treasurer.

Gardner Div. Promotes Two

Two promotions have been announced at the Gardner Division, Diamond Gardner Corp., Middletown, Ohio.

Gex Condit has been promoted to staff assistant to the vice president and general manager; and Jack Vonderhaar moved up to supervisor of shipping and inventory planning.

Mr. Condit joined Gardner in 1950 as an industrial engineer, and was promoted to supervisor, work standards, in 1954. In early 1956, he became supervisor of methods.

Mr. Vonderhaar joined Gardner in 1951 as a rate clerk in the traffic department, became chief rate clerk in 1953, and was promoted to transportation service supervisor last March.

Joins Rhinelander

Ralph Kinzel has joined the staff of Rhinelander Paper Co.'s research and development department. A chemistry major, he graduated from Wisconsin State College in Oshkosh in 1957.

Superior Names Sales VP

Marc Van Buskirk has been named vice president of sales for Superior Paper Products Co. Inc., Marion, Ind., a subsidiary of Cornell Paperboard Products Co., Milwaukee. He will have his headquarters in Chicago.

Malcolm McVickar

Martin L. Schnechtman

Polyethylene Group Elects Officers

The polyethylene extrusion coaters group of Specialty Paper and Board Affiliates Inc. held its annual meeting in New York during "Paper Week." Malcolm McVickar of Crocker, Burbank Papers Inc., Fitchburg, Mass., was elected chairman and Martin L. Schnechtman of Continental Can Co., Shellmar-Betner Division, Mount Vernon, Ohio, vice chairman, for the ensuing year.

In addition the following were elected to the group's Executive Committee:

C. W. Hoffman—Riegel Paper Corp., New York City. E. D. Mendels—Ludlow Papers Inc., Needham Heights, Mass.

The group now is composed of 18 companies concerned with polyethylene extrusion coating of paper, paperboard, film, foil and other substrates. The meeting was to a large extent devoted to extensive reports from the group's technical and promotion and market development committees. Particular attention was directed to technical projects in being and suggested for future study. In addition there was extensive exploration of general and specific marketing areas incident to present and potential demand for polyethylene extrusion coated products.

Howard Smith Sales Changes

Howard Smith Paper Mills Ltd., has made the following staff changes in the sales department: A. J. Black named assistant to the sales manager; R. E. Richardson returning from Winnipeg to Toronto to serve in a senior sales capacity in Ontario; R. A. McDonald is transferred from Toronto to Winnipeg to succeed Mr. Richardson as manager of the Western Sales Division.

Weinfurter Joins Consolidated

Edward Weinfurter has joined the Wisconsin Rapids division of Consolidated Water Power & Paper Co.

Mr. Weinfurter will serve as training supervisor for the new semichemical recovery plant which is now under construction and scheduled for operation this spring. Mr. Weinfurter was employed by Nekoosa-Edwards Paper Co. as Nekoosa mill pulp superintendent prior to his recent retirement. While employed there he had experience with the operation of a soda recovery pilot plant developed by Western Precipitation Corp.

David Larsen has been appointed process engineer for the new recovery plant. He joined the company in 1953 and has been working in the Wisconsin Rapids division sulphite pulping laboratory.

The experimental recovery plant incorporates a new process developed by Western Precipitator Corp.

Wible Names Chase Purchasing Director

J. R. Wible has been appointed director of purchases for the Chase Bag Co., New York City. Mr. Wible succeeded F. H. Rhoden, head of the firm's purchasing department since 1944, upon his retirement December 31.

Immediately prior to the appointment, Mr. Wible was on special assignment at the Chase Bag Co. executive offices in New York. He joined the firm in 1948 and was associated with its Philadelphia manufacturing branch for nine years.

Champion Names Ass't Production Manager

John W. Ramsey has been named assistant production manager at the Champion Paper and Fibre Co., Hamilton, Ohio. Mr. Ramsey first became associated with Champion in 1919. In September of 1950, he was promoted to general superintendent of paper manufacturing, a position he held until this latest advancement.

Moraine Adds Jack as Supt.

Moraine Paper Co., a division of American Envelope Co. in West Carollton, Ohio has appointed John E. Jack superintendent of the bleach plant and stock preparation department to replace the late Charles Piper.

Mr. Jack was with Sorg Paper Co., Middletown, Ohio for 22 years prior to his association with Moraine.

Miles Elected Mengel VP

Harry E. Miles has been elected a vice president and director of Mengel Co. and named general manager of the firm's corrugated box division. With Mengel for 35 years, he had been for the past nine years general sales manager for the division. He succeeds James C. Courtney, who retired after 39 years with the firm.

Thomas McMurray

Appointed Crystal Sales Manager

Thomas McMurray has been appointed general sales manager of Crystal Tissue Co., Middletown, Ohio.

He has been associated with Crystal since 1946, having started as sales statistician. He was later promoted to assistant sales manager and in 1950 became sales manager—mill products.

John E. Egan

Named Director of Waxed Paper Institute

John A. Egan has been named executive director of the Waxed Paper Institute and the Waxed Paper Merchandising Council by the board of directors.

Mr. Egan succeeds Laurence T. Herman who resigned to become advertising director of the Detroit *News*.

Mr. Egan has been Eastern regional manager of the Waxed Paper Merchandising Council since 1954.

Rhinelander Promotes

Donald Peterich, who has been a project engineer at the Rhinelander Paper Co., has been named engineering maintenance superintendent, succeeding W. G. Engelgau, who is now in charge of maintenance throughout the St. Regis Paper Co. organization.

Mulford C. Baker, who has been in charge of waste control, has been appointed chief control chemist to succeed David Lowe, who has joined Milprint, Inc.

Canada Paper Co. Fills Sales Posts

Philip Sanford has been appointed sales manager of Canada Paper Co. B. M. Wood has been named sales manager of the Specialty Paper Division. Mr. Sanford, on his return from a visit to South American markets, will assume his new duties in April and will reside in Montreal. Mr. Wood, formerly supervisor of sales, Consumer Products Division, will continue to make his headquarters in Toronto.

Standard Elects Kidd

R. M. Kidd, an employee of Standard Paper Manufacturing Co., Richmond, Va. for 20 years, has been elected as assistant secretary-treasurer.

National Vulcanized Promotes Bulterman

Leo Bulterman has been named supervisor of the process engineering department located at the Kennett Plant of National Vulcanized Fibre Co.

Mr. Bulterman has been with National for 2½ years, and is active in the American Chemical Society and the Engineers Club of Philadelphia.

Union Bag-Camp Makes Multiwall Changes

Union Bag-Camp Paper Corp. has made the following changes in its multiwall bag sales division:

Henry Scott, formerly headquartered in Birmingham, Ala. has been transferred to the company's office in Denver, Colo. to succeed the late Bart O'Hearn. His territory will include Utah, North Dakota, South Dakota, Wyoming, New Mexico, Colorado, Montana and parts of Nebraska, Kansas and Idaho.

John Cox, formerly of the New York sales office, will take over Mr. Scott's southeastern sales territory. He will cover Mississippi, Alabama and part of Tennessee.

Henry Scott

John Cox

NEWS OF CONVERTERS

Martin Plans Plant in Saskatchewan

Plans to establish an $800,000 corrugated container manufacturing plant were announced in Regina, Saskatchewan, by officials of Martin Paper Products Ltd.

George B. Hills Jr., vice-president and general manager, said the new plant would give the company an unbroken chain from Manitoba to British Columbia. Other plants are located at Winnipeg—the firm's head office—Calgary, Edmonton and Vancouver.

The new container plant will be located on a seven-acre site in Regina's northeast industrial section. The plant itself will be a one-story building covering approximately 40,000 sq. ft., and incorporating latest designs and techniques.

Final design and construction details will be prepared shortly by company engineering staff, with tenders expected to be called in about six to eight weeks, and construction to start late this spring.

Martin Paper Products Ltd., is a jointly-owned subsidiary of Powell River Co. Ltd. and MacMillan & Bloedel Ltd.

Fairbanks Container Promotes Swick

Fairbanks Containers, Inc., Middletown, Ohio has announced the promotion of Peter Swick to production supervision. Fairbanks Containers is a division of the Ohio Boxboard Co.

Mr. Swick was formerly employed at the company's Pittsburgh plant and spent a year in training at the company's mills and home office in Rittman, Ohio.

Beck to Manage Newark Plant

Jack C. Beck, division manager of production planning for the Shellmar-Betner division of Continental Can Co., at Mt. Vernon, Ohio has been transferred to Newark, Ohio as plant manager.

Mr. Beck joined Shellmar-Betner Corp., the forerunner of the Continental Can Co., local division, in 1935, in the production control department and was named division manager of production planning in 1954.

Supreme Ribbon to Build New Plant

Supreme Ribbon Corp. of New York has acquired a 2½ acre site for a plant at Burke Lane, Syosset, Long Island, N.Y. The plant will be devoted to the production and warehousing of the company's "Imperial" line of gift wrapping papers, foils, and tyings.

Production in the new plant will be flowing by early May of this year, and the additional space, plus new heavy machinery will double the firms production capacity.

The sales staff has been increased, and is under the direction of Edward Stelzer. Robert J. Miness will assume control of the production of the expanded facilities.

O-I Creates New Multiwall Posts

Creation of three new positions in the Multiwall Bag Division of Owens-Illinois Glass Co. has been announced by Tom W. Brown Jr., newly-appointed manager of the division.

To assist him in sales and production matters, Mr. Brown named James C. O'Neal Jr., as sales assistant, and William F. Connelly as production assistant.

William H. Morris was named product sales manager, and will handle various specialized areas of marketing. He is currently assigned to the promotion of insulation bags as part of the company's new emphasis upon production of that type of bag for industrial purposes.

View-Tainer to Operate in Fall River

View-Tainer Corp. has leased 24,000 feet of ground floor space in the Border City Mill No. 2, Fall River, Mass., for the manufacture of plastic containers and set-up paper boxes. The new plants will employ 50 persons. General manager is Philip Solar, president and treasurer is David Somer.

Ohio Boxboard Promotes Graber

Edward Graber has been named assistant carton superintendent at the Ohio Boxboard company in Rittman, Ohio.

Army Tests Paper Sandbag For Emergency Period Use

A paper sand bag which could replace the standard burlap sand bag has been developed and will undergo tests by the U. S. Army Engineer Research and Development Laboratories at Fort Belvoir, Va., the Department of the Army has announced.

The knitted paper sandbag has all the qualities of its burlap counterpart, both wet and dry, and also handles and stacks satisfactorily, the Army said. On the basis of restricted field tests, the knitted and chemically treated paper sandbag was found able to survive 60 days of the most severe weather conditions; resist the shock effects of a close blast, at least as well as burlap; and have a service life in water compared to that of the burlap bag.

The Army pointed out that during an emergency period, when burlap might not be readily available, the type of paper being used in the current experiments could be procured without difficulty.

P. B. Duffy Promoted by Kress Box

Philip B. Duffy has been promoted to executive vice president of the F. J. Kress Box Co., Pittsburgh, Pa. He previously was vice president and general sales manager.

Mr. Duffy, who has been with the company throughout his entire career, started 30 years ago as an order clerk. He is a director of the Fibre Box Assn.

Standard Bag Enlarges Production Service

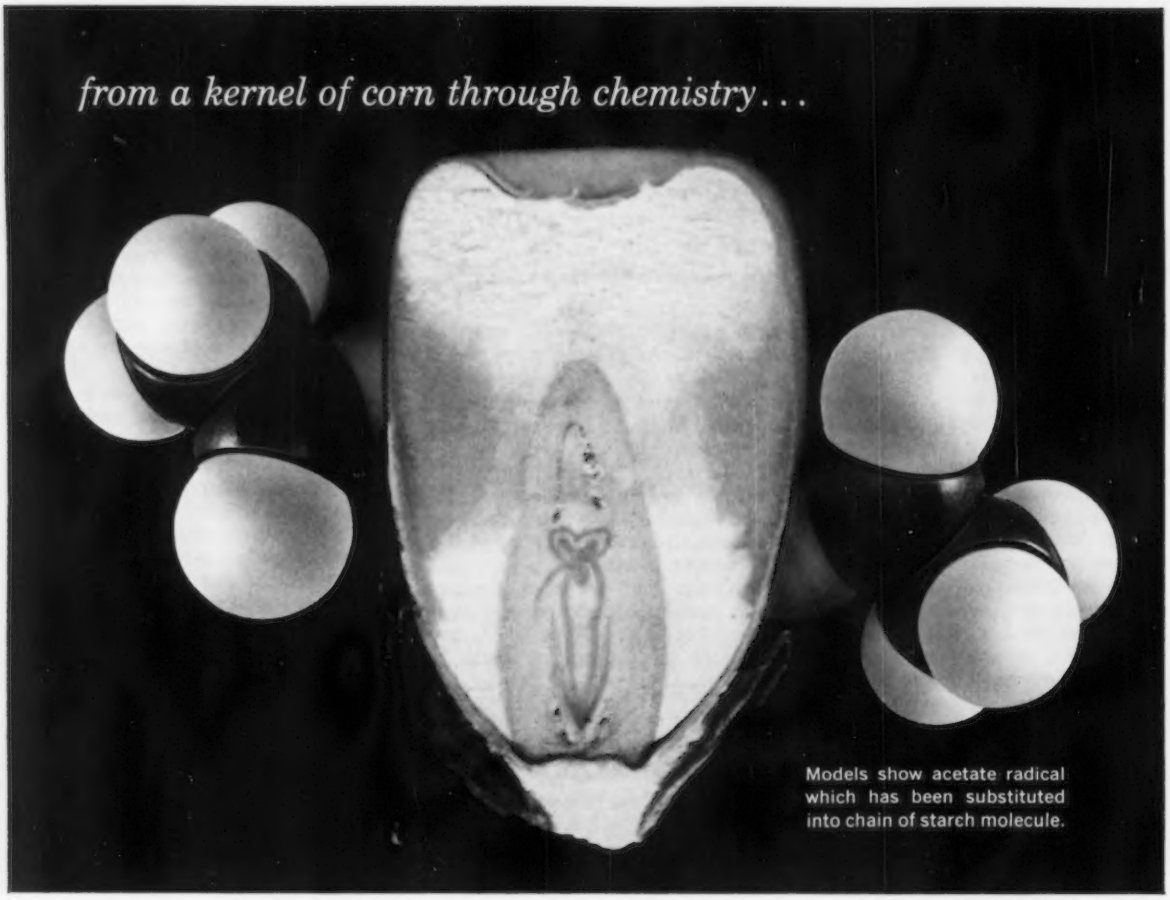
Standard Bag Corp., Long Island City, N. Y., and Richmond, Va. have added new personnel with their enlarged production capacity. Production is now headed by Thomas H. Ryan, formerly superintendent of manufacturing for International Tel. & Tel. Also coming to Standard Bag for I.T. & T. as head of the engineering staff is Gregory Policastro.

Howard Purcell, formerly with the Curtiss Wright engineering staff now directs the industrial engineering section.

Raymond De Rise, who has been with the company 30 years, continues as plant superintendent.

CZ Southern Post

R. J. Fitzpatrick has been named Southern Division sales representative for Crown Zellerbach printing papers. He will replace Keith R. Cutting who will become assistant regional sales manager in Chicago.


from a kernel of corn through chemistry...
Models show acetate radical which has been substituted into chain of starch molecule.

NEW STARCH DERIVATIVE

Another National first! This time: KOFILM, a unique starch acetate ester for surface sizing and coating all grades of paper where surface characteristics and strength are important.

KOFILM greatly prolongs viscosity stability while offering high strength and excellent film forming properties. The result? Consistently high pick strengths. Uniform finishes. Improvements in oil resistance and wax holdout. Excellent pigment binding.

KOFILM is available in a complete range of viscosities. Why not compare it against any starch product or starch derivative that you may now be using. Write for data and sample.

National
STARCH PRODUCTS INC.

270 Madison Avenue, New York 16 • 3641 So. Washtenaw Avenue, Chicago 32 • 735 Battery Street, San Francisco 11

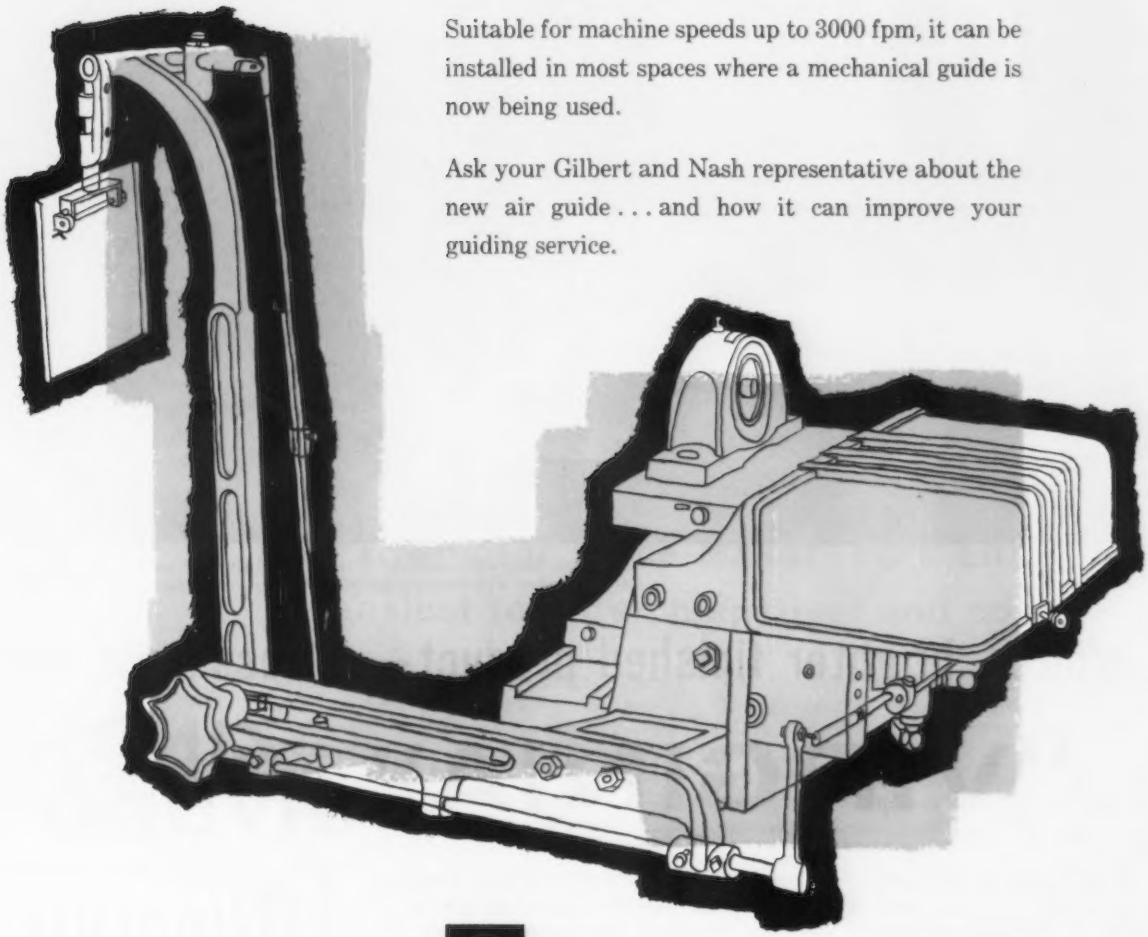
NEW AIR GUIDE FROM GILBERT AND NASH

Here's a new guiding service from Gilbert and Nash —an efficient economical air-operated guide. Simple, too, with a minimum of mechanical moving parts.

The new Gilbert and Nash air guide has a constant rate of correction, regardless of the machine speed. And when correction is needed, there's no lag! The air guide reacts instantaneously!

Suitable for machine speeds up to 3000 fpm, it can be installed in most spaces where a mechanical guide is now being used.

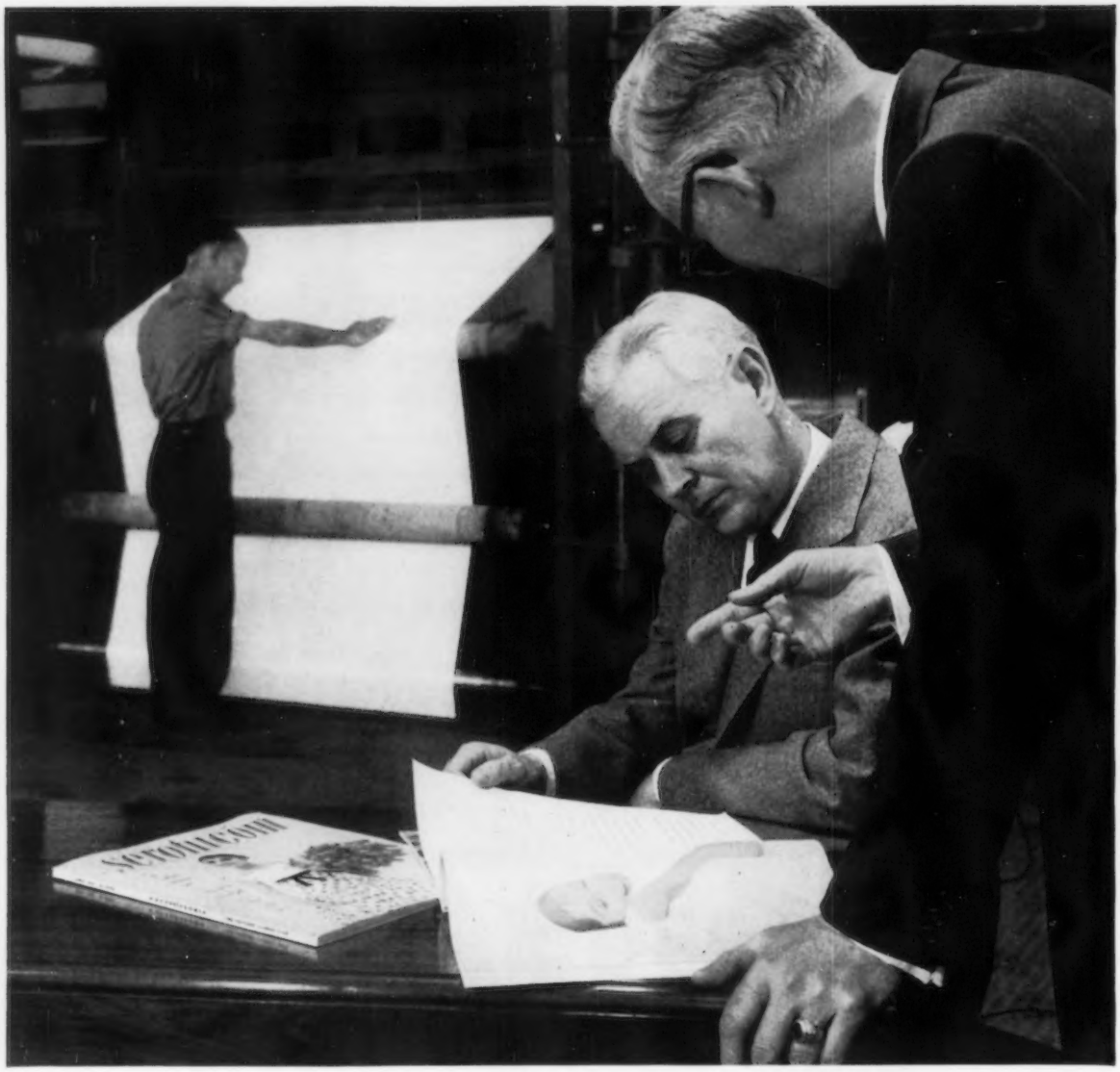
Ask your Gilbert and Nash representative about the new air guide . . . and how it can improve your guiding service.



Manufactured and sold exclusively by

APPLETON MACHINE COMPANY

APPLETON, WISCONSIN



One of the many ways in which "Virginia" Zinc Hydro is used to produce a better finished product is in making paper stocks for popular magazines whiter and brighter.

Whiter, brighter finished product—at less cost with

"VIRGINIA" ZINC HYDRO

Paper mills using "Virginia's" low-cost zinc hydro *average* a 10-point brightness gain in upgrading groundwood pulp—some mills achieve as high as 13 points. Putting it another way—that's improving the quality of groundwood pulp for as little as 60c per brightness-point per ton!

"Virginia's" is the only high-test ZnS_2O_4 commercially available. Our technical experts are at your service to meet with you in your plant to see if "Virginia" Zinc Hydro can reduce your processing costs, increase your profits. When you call us in, you call in more than 35 years of service to industry.

Phone, write or wire. Industrial Division, VIRGINIA SMELTING COMPANY, Dept. 258, West Norfolk, Va.

VIRGINIA® Chemicals

Field Offices: NEW YORK • BOSTON • DETROIT
CHICAGO • ATLANTA • ASHEVILLE

Available in Canada and many other countries

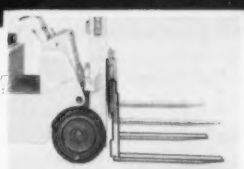
Today's industries need Towmotor Continuous Operation

New Towmotor "Pace-Maker" Fork Lift Truck is easiest to enter, maneuver and control:

Towmotor engineering has skillfully combined dual-entry convenience, extra leg-room, handy 12-inch reach controls and easy maneuvering ability in the new "Pace-Maker" series fork lift trucks. You get a lot of advance features not duplicated in any other industrial truck!

Towmotor balanced weight distribution assures full traction with or without load. Positive-action hydraulic lift system guarantees instant response. Maximum free lift range is tops in industry. New standards of easy handling are established by "Pace-Maker" features like these!

Send for Booklet SP-23 showing how industry's most complete line of fork lift trucks will improve your plant operations and lower your production costs.



Towmotor's Maximum Free Lift Range taps all for reachability—lets you safely utilize the "top ⅓" of valuable storage space usually wasted.

TowmoTorque Drive offers you cushioned "creep" control unequalled in the industry today. Driving ease is more than tripled when you add Towmotor Power Steering.

New "Pace-Maker" Model 600 is typical of the easy-handling fork lift trucks in the combined Towmotor-Gerlinger line. Load capacities from 1500 to 40,000 pounds.

Leaders for 39 years in building Fork Lift Trucks, Tractors and Carriers

TOWMOTOR — THE ONE-MAN GANG — **GERLINGER**

Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation, Cleveland 10, Ohio

☐ Send free Towmotor Booklet SP-23

☐ Send free Certified Job Studies relating to our business which is:

Name_____

Company_____

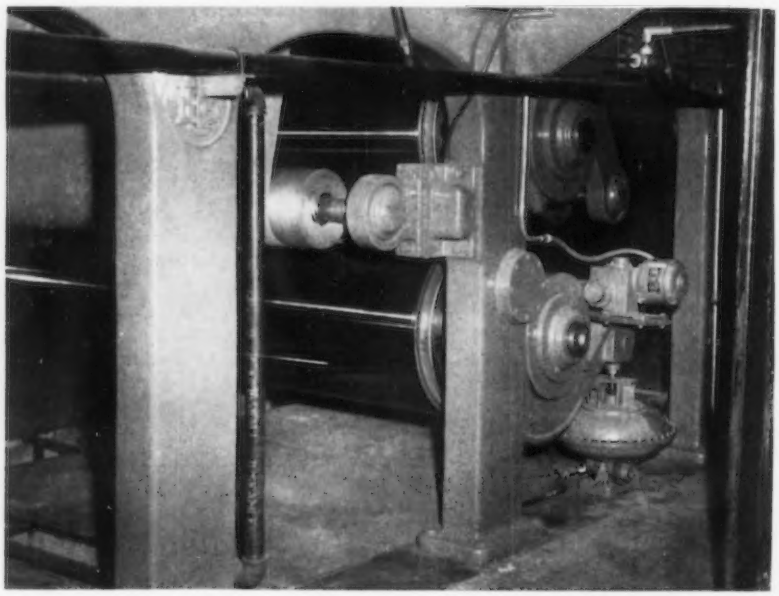
Address_____

Mail to **TOWMOTOR CORPORATION,** Cleveland 10,

Ruberoid's Newest Dry Felt Machine...

. . . produces 150-inch wide sheet at Gloucester City, N. J. mill

Wet end operation of new single cylinder machine is viewed by Louis Sarlo Jr., felt mill superintendent.



Smoothing press rolls, mounted in the middle of the dryer section, are chrome plated.

Ruberoid Co., the nation's largest single producer of asphalt saturating medium, now has in operation a new dry felt machine at their Gloucester City, N. J. mill. Started in mid-1957, it is the third felt machine operating at the Gloucester City plant, and is designed to produce 65 tons per day. The new facility is a single cylinder counter-flow type machine with a trim width of 150 inches. It replaces a narrower, obsolete unit which had been in use in the mill for many years. Built by Black-Clawson Co., the machine was engineered in cooperation with Ruberoid's staff.

Dry felt, an absorbent, specialized paper product made from rags, waste paper and wood fiber, is the base material for asphalt coated and saturated products. It is widely used as building paper, shingles and siding. Dry felt also goes into hard floor coverings and automotive board. Part of the new machine's output will be utilized in Ruberoid's own roofing mills; the remainder will be sold to long-term contract customers.

This new installation brings the number of felt machines operated by Ruberoid to ten. These are located in seven plants in various parts of the country.

Felt Machine Features

Built by the Black-Clawson Co., the machine was engineered in cooperation with Ruberoid's staff. The new machine was located in the mill building through rearrangement of previously existing equipment. It replaces a narrower obsolete unit of 65-ton-per-day capacity and 72-inch trim.

The new No. 5 dry felt machine is a single-cylinder, counterflow type unit with overflow having a 48-inch diameter cylinder with 166-inch face. Trim width is 150 inches and speed range is 40 to 240 feet per minute.

The machine is equipped with short center Black-Clawson V-belt drives, variable speed line shaft, and enclosed spiral bevel gear drives. The first press, 28 inches diameter by 166 inches face, is a straight through type, while the second press, of similar size, is a reverse type. Both presses are loaded pneumatically.

Vacuum pumps for the new machine were supplied by Nash. A Scofield con-

ditioner is used on the first felt with a Vickery conditioner on the second felt. Showers and doctors were supplied by Lodding. Water used in the felt making process is recycled through Bird Save-Alls to provide minimum contamination and economic use of fresh water. Common wet felts, manufactured by Albany Felt Co., were used on both bottom and press felt positions.

Dryer Section and Finishing

The dryer section has thirty-two 48-inch by 160-inch dryers and one 24-inch by 160-inch dryer, all operating at 75 pounds steam pressure. The dryers of seamless cast iron construction, are equipped with anti-friction bearings, a TECO oil circulating system, and C-B drainage system. Dryer gears are mounted inside the elevated double deck type dryer frames which are of box and rib cast iron construction.

Also mounted in the dryer section are two 28-inch by 160-inch chrome plated smoothing rolls, and one 48-inch by 160-inch cooling drum. A dryer hood and vapor absorption system were supplied by Ross.

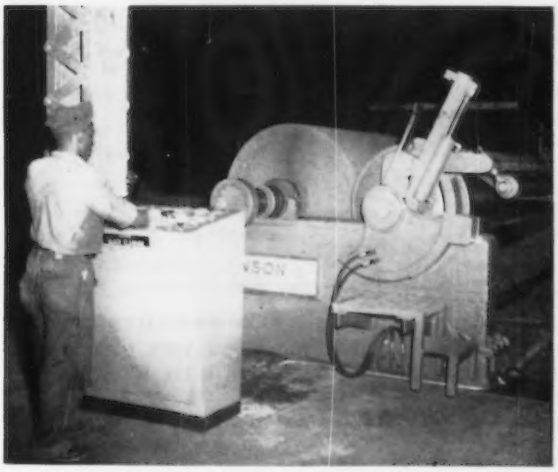
The 4-roll calender stack consists of one 28-inch diameter, one 20-inch diameter, and two 16-inch diameter rolls all of 158-inch face width. Finishing end equipment also includes a 36-inch Black-Clawson Autoflyte reel, Dilts two-drum winder, and Jamar Olmen trim blower which conveys the trim back to the stock preparation area.

Operation

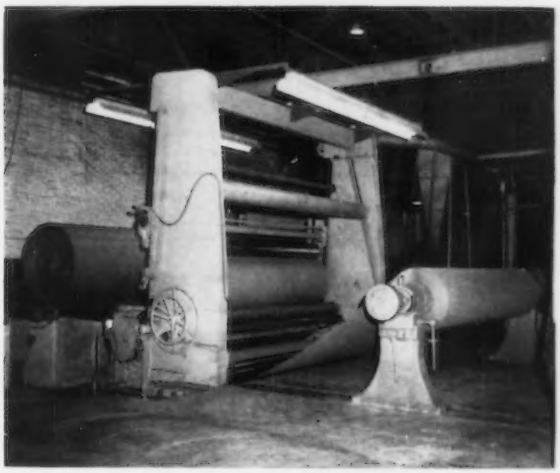
Primarily No. 5 machine will use existing stock preparation equipment in common with other felt machines in the mill. This equipment was supplemented by the addition of Centrifflers for stock cleaning and a Claflin refiner.

The machine is arranged so that the web of paper after being formed on a 48-inch diameter cylinder in a counter-flow vat, passes through the first main press of a plain forward type, then through the second main press of the reverse type. The web of paper then passes over the Toledo continuous weighing scale, travels over two sections of 48-inch diameter dryers, through a smoothing press, over a third section of dryers including the cooling drum which is immediately followed by the 4-roll calender stack. The sheet is then wound on the Autoflyte reel, then transferred to an unwind stand for slitting and rewinding.

General plant superintendent, C. J. Danaher, and Mr. Sarlo inspect sheet as it enters calender stack.



Sheet is wound on Autoflyte reel as worker operates controls.



Roll of dry felt mounted on unwind stand feeds to slitters and winder.

How to produce the highest quality bleached pulps

• A survey meeting with your plant personnel is the first step in the plan, at which time the latest information on bleaching is covered.

Du Pont's 6-Step Service Plan can give you the answers, since it is based on a thorough analysis of your operation

Here's your chance to improve product quality by increasing your pulp brightness. Du Pont's 6-Step Service Plan can show you the advantages of peroxide bleaching . . . how to get maximum return on each dollar invested.

The plan gives you a comprehensive survey of your bleaching requirements: 1) a discussion of latest bleaching methods, 2) laboratory investigation of your own pulp, 3) mill trial to prove out Du Pont's recommendations, 4) consultation with your engineers on bleaching equipment, 5) technical help during mill start-up, 6) continuing assistance after mill start-up.

You'll find the plan extremely flexible. Some of the steps can be eliminated, depending on the situation at your plant. And Du Pont's 6-Step Plan can benefit producers of groundwood, chip mechanical, kraft, sulfite, soda and recovered pulp.

We'll be glad to give you the complete story on our 6-Step Service Plan for pulp bleaching. Just write to Du Pont on your letterhead at the address below.

DU PONT'S 6-STEP SERVICE PLAN

1. Mill Conference
2. Lab Trials
3. Mill Trial
4. Bleachery Planning
5. Bleachery Start-Up
6. Continuing Service

PEROXIDES

ALBONE® hydrogen peroxide SOLOZONE® sod. peroxide

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

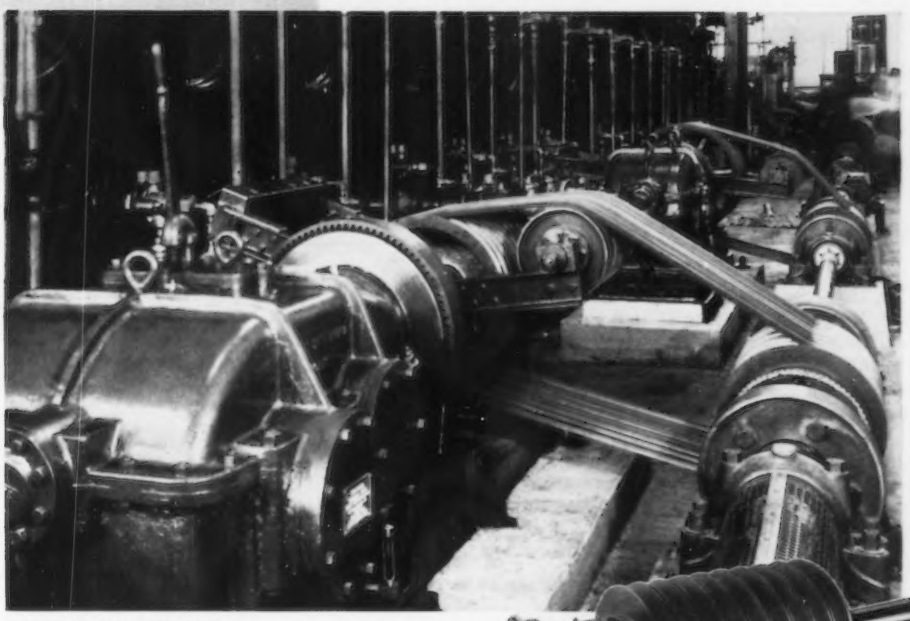
ELECTROCHEMICALS DEPARTMENT
Peroxygen Products Division

E. I. DUPONT DE NEMOURS & CO. (INC.)
Wilmington 98, Delaware

FIRST WITH PROCESSES AND SERVICES FOR PEROXIDE BLEACHING

TEXROPE DRIVES

more than 16 years on the job!



SANDY HILL DRIVE features "clean" design for easy maintenance. When *Vari-Pitch* sheaves are used neither basement nor mezzanine is required for the line shaft.

EXCLUSIVELY from Allis-Chalmers are these integral shaft *Vari-Pitch* sheaves. On your paper machine drives they mean more accurate speed control, more continuous output.

Vari-Pitch Sheaves still maintain 0.1% speed control on Sandy Hill Drive at St. Regis Paper

In 1940, this Sandy Hill Selective Drive was installed on a paper machine in the St. Regis Paper Company's Deferiet, New York, mill. Today, *it's still running* with never a shutdown due to operating failure.

Regulating this remarkable installation are integral shaft *Vari-Pitch* sheaves. Their use has resulted in unvarying draw between sections and true simplicity of operation.

As a replacement or as a new machinery component, specify *Texrope* drive equipment everywhere in the mill. Contact your A-C sales office or distributor, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wis.

Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

A-5484

Fully automatic control of the paper machine approaches realization with . . .

The A-B-C System for Moisture and Basis Weight Control

R. W. Ott

*Isotope Products (Instrument Div.) Inc.
Buffalo, N. Y.

In a time when the word "automatic" is being applied to nearly everything from mechanical pilots to egg cookers and auto transmissions, it's occasionally desirable to stand back a few paces and take a long hard look at just what the word means. The suggested picture would be a machine requiring no supervision of any sort and where labor would be only indirect. To all of you, it will be obvious that such a paper machine is a long way off indeed; and yet, if we compare 50 years ago to 5 years ago, perhaps that "long way off" begins to appear less and less.

Beta Gage a First Step

The first little "beta ray gadget", experimentally stuck out over the edge of a running sheet a few short years ago, did nothing more than indicate that in a single spot, in a given time, a change occurred—this indication was made without regard for what the change was, or why, or, in fact, without very much accuracy as to how much of a change had occurred. The installation, however, already has led to a highly refined application which not only answers all the questions above but a great many more besides.

Historically, this little "on the edge" beta gage had a quick succession of improvements as the paper industry made known its likes and dislikes. One of the first of these improvements was the precalibration of the unit to read directly in pounds per unit area, which led to automatic standardization and an electrical traversing system.

Another early addition was the integrator for averaging all the unit saw during such a scan or traverse. This allowed the true average weight in the machine direction to be presented on a recorder—and shortly became the basis for the addition of motor-operated gate control elements. Another early and still useful development was the Profiler for showing the level of cross machine samples taken at reel turnups.

Economic Justification

Since the units were by now becoming considerable items capital-wise, the subject of economic justification began to crop up more often. In the ensuing pursuit of this "economic justification," it became increasingly evident that there were factors other than "total mass" to be considered.

This, then, was the problem: a single measurement of a single characteristic-total weight, made up in turn of two components—moisture and fiber—each variable, both dependently and independently, was trying to maintain uniformity of the single characteristic by one and only one variable—the stuff gate.

Moisture Measuring Device

At the 1957 TAPPI meeting in New York, J. A. Hart and W. Gallay presented a paper describing their successful use of a moisture measuring device based on the electrical conductivity of paper. This device, called the Aquatel, and its amalgamation with the Betameter and proper controllers has led to the title of my paper, "The A-B-C System for Moisture and Basis Weight Control."

The use of conductance measurement to measure moisture was not new. It had, in fact, several apparent advantages, such as its high sensitivity to moisture changes, and the directness of the measurement. The use of direct current for making the measurement was the common approach, but it had several disadvantages.

The use of alternating current, it was felt, would permit these problems to be overcome, and still retain the remarkable sensitivity of the conductivity method. The conductivity of paper, and many other materials, changes so greatly with changes in moisture content, that by choice of a suitable measuring arrangement, the effects of other variables may be made small enough to be neglected in practical application.

Principle of Operation of the Aquatel

The electrodes of the moisture gage are excited by 1500 volts, 60 cps. fed through a small hazard eliminating condenser.

Since a.c. is used, it will be obvious that a measure of resistance to current flow will actually be one of impedance rather than just resistance. Accordingly, any signal derived would include the measure of both resistance and capacitance. Since only the resistance is a

* Recently acquired by Curtiss Wright Corp., Electronics Div., Carlstadt, N. J.

reliable measure of the sheet moisture, it is desirable to cancel out the capacitive component. This is achieved by separating the two, and cancelling out the capacitive portion by means of a servo loop system. The resulting resistive signal is fed through a linearizing servo loop in order to derive finally an output signal directly proportional to paper moisture, and this is presented on a direct reading precalibrated recorder.

The major disadvantages of the method are:

1—Sensitivity to temperature of the paper.

2—Sensitivity to distribution of moisture within the paper.

The first item can be compensated. The second item has proved to be of no practical consequence.

The advantages, however, are most significant.

1—High sensitivity. A change of one per cent moisture results in a change of 500 per cent in resistance.

2—The variations in basis weight which occur during normal production have a negligibly small effect.

3—Insensitivity to variations in surface smoothness (even creped papers can be tested successfully).

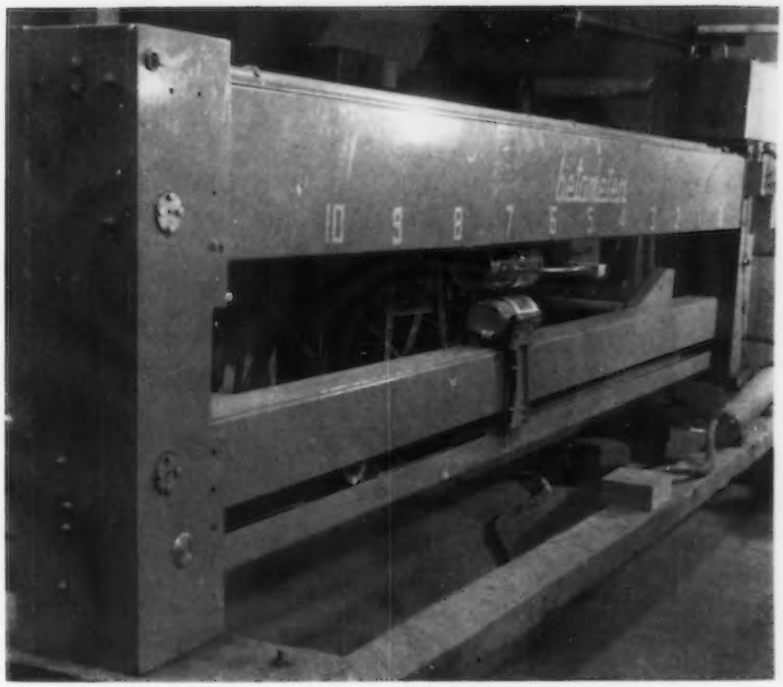
4—Perfect contact between electrodes and paper not required.

5—The electrodes contact the paper on one side only. This is most important to the successful application of the unit as a scanning measurement.

6—Only a single point calibration is required.

7—Response time is practically instantaneous. Measurements can be made in a few seconds.

8—Self-monitoring for defects and inaccuracies—it cannot operate if error is present in the system.



O-frame installation on the new paper machine of Rolland Paper Co., St. Jerome, Quebec.

Goal of the Combination System

The end goal of a combination system involving the scanning measurement of both the moisture and basis weight would be the control of each variable in both the cross machine and in-machine direction. The latter obviously lends itself more readily to techniques presently available for automatic control. Cross machine adjustments have received considerably less attention and development, partly due to the lack of really accurate operating statistics and the difficulties of obtaining good data on trials and experiments.

With the use of a scanning Betameter at the dry end of the machine, it is relatively simple to so attach the Aquatel that the running heads of both instruments track across the sheet together and so measure exactly the same paper. The Betameter can furnish a millivolt output signal which is representative of the total mass of the sheet when displayed on the precalibrated scale of a recorder. Likewise, a millivolt output signal can be obtained corresponding to the per cent moisture.

These signals can be so arranged to yield the net weight of fiber bone dry. This makes it possible, for what seems to be the first time in history, for a papermaker to adjust his stuff inlet purely on the basis of fiber distribution.

Typical Application

Let us consider a typical application of the A-B-C system to a 200 inch trim machine. The system will include a large "O" frame mounting and traversing unit to which both the Betameter and the Aquatel will be attached. It furnishes a transmission type Beta Gage for maximum accuracy and stability at the point of the most critical measurement—just before the size press or coater. This is the point at which it is desirable to know accurately both the total weight and the per cent moisture—and thus the bone dry weight.

In operation, both of the measuring heads scan across the web from back to front simultaneously, and then return quickly to the back of the web to cycle again.

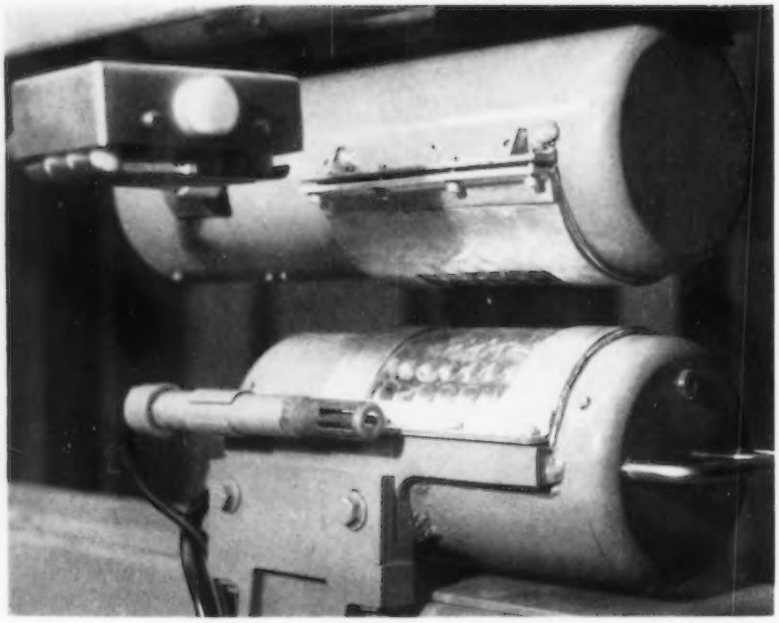
During the slow scan, which is normally at ten feet per minute, a continuous signal flows from each of the heads. Since it is furnished through a fast response, or short time constant circuit, it can be displayed on any fast moving recorder chart as the profile of the sheet.

X-Y Recorder Provides Sheet Profile

Fortunately, the instrument industry for some time has had a device known as an X-Y recorder which seems to fit the requirement extremely well. It provides a series of scans, placed horizontally and successively. An operator viewing these will be very apt to have an immediate understanding of nearly all the trends occurring on the machine.

The measuring signals are also delivered to standard wide strip or circular chart recorders after being electronically integrated. This furnishes a constant record of the running average of either weight or moisture in the down-machine direction. Thus, a specification pen set at the desired weight on one recorder-controller, and the desired moisture on another, can be compared with the actual trace of each variable.

A displacement of either from its target pen represents a certain value which can be fed into an electrical or pneumatic control element to bring the pa-



Close-up of measuring head showing Betameter source-detector assembly with temperature compensation. Aquatel measuring head is at top left.

per to specification automatically. When such a correction is made on basis weight, the control element is automatically locked from making another change until the stock affected by the change is over the machine and has been measured.

Papermaker Now Has Two New Tools

This "O" frame before the coater constitutes the "heart" of the system with its presentation of both bone dry and nominal basis weight, and per cent moisture (both cross machine and down machine), together with control of the stock gate from bone-dry basis weight, and control of the dryers from per cent moisture. To this is added a backscatter beta gage, mounted just following the last press, and reflecting from the first dryer roll.

It is obvious that the papermaker now has two new tools at his command—one, a profile of the fiber alone; the other, a profile of the wet-end moisture alone. If desired, this signal, too, can be displayed on the X-Y recorder, further enhancing its value as a machine correction aid.

The last link in the chain is another Betameter at a point near the reel which reveals a picture of the coating weight addition as well as the level of the coating across the sheet.

In summation: This particular system will furnish the following measurements: the fiber profile; the moisture profiles (both before and after the dryer); the profile of the total uncoated sheet, of the coating alone, and of the total coated sheet entering the reel; as well as the average value of the moisture and basis weight after the dryers.

To what use all this information can be put can only be appreciated by an experienced papermaker, but some of the best known advantages are apparent. For instance, adjustment of the slice to achieve a specification fiber profile will undoubtedly quicken grade changes, and make it possible to observe variation in cross sheet profile, due to such variables as machine speed change, wire pit level, etc. Likewise, the coating level measurement will undoubtedly lead to changes and corrections now nearly impossible to make. Certainly, the moisture profile at the wet end will lead to substantial improvements in tune-up.

Another example would be the continuous picture available of the decreasing efficiency of the felt—which knowledge might lead to a much improved program for replacement over many now in use. Discreet crown in press rolls could also be observed as it affects the moisture profile.

System Applied to Cylinder Machine

I would like to turn for a moment to consideration of an A-B-C system applied to a slower operating machine, such as a multi-cylinder board machine. It has become apparent to many that a beta gage at the dry end can never successfully control the stock, since the point of control and the point of measurement are as much as 12 minutes apart. On the other hand, a beta gage at the wet end is subject to considerable error as the result of fluctuations in freeness and variations in wet end extraction efficiency. However, it does possess one advantage—it can supply a control signal and "see" the change result within two or three minutes at most. This is an extremely important advantage; and, upon its application is based the A-B-C system for board machines.

A standard transmission beta gage, either "C" or "O" frame type mounting, is installed at both ends of the dryer with an Aquatel complementing the dry end unit. The wet end gage is on control of the basis weight. This is accomplished by varying the flow of the filler. A precalibrated scale, exactly like the scale at the dry end, is provided; and the target is set in terms of the bone dry specification.

Indicates Clothing Efficiency

The operator, on making a change or startup, sets the target pens on both the wet and dry gages to the bone dry specification weight. When the sheet is on the dryer, and is within plus or minus 20 per cent of specification weight, he can switch to automatic control by the wet end gage.

As soon as the sheet produced after this time is through the dry end measurement system, the automatic control can be initiated there. Its function is to compare the integrated average of the bone dry weight with the specification; and, if a deviation exists, it automatically resets the wet end gage target point by an amount calculated to bring the bone dry weight to specification.

Incidentally, you may have noted that the position of the wet end target pen as contrasted with its dry end counterpart will reveal the true relationship of fiber and moisture going on the dryer. One long time superintendent expressed the opinion that this feature alone, which is an indication of clothing efficiency as well as wet end conditions in general, would be worth the cost of the entire system—at least in his mill.

Since the units at both ends of the machine are continuously scanning, all the many presentations described before are produced with this system.

News Machine Variations Controlled

An example of the economics on a news machine might run as follows:

The final average moisture content cannot be significantly increased without improving its uniformity through-

out the entire sheet. Since it is possible to produce newsprint with a moisture content approaching 12 per cent before blackening in the calender occurs, and whereas a good deal of paper is produced today with partial blackening at an average moisture content of 8 per cent, the importance of sheet uniformity is obvious.

The variations in both basis weight and moisture can be analyzed by dividing them into groups:

1—Across machine variations.

2—Machine direction variations.

(a) Short term variations generally cyclic in nature with frequencies from 40 cps. to 4 per hour.

(b) Long term variations generally of a non-cyclic nature.

Let us consider what change the A-B-C system can make in each of these variables:

1—Across machine.

Alternative presentation of the fiber profile and the per cent moisture profile shows whether the profile irregularities are caused by poor fiber distribution to be corrected by slice adjustment, or poor wet end operation to be corrected by press adjustments, felt and dryer checks. Since fiber profiles are presented, very accurate settings of the slice can be made and checked within a few minutes on the next scan. Once the fiber profile is acceptable, remaining wet streaks must be corrected by press, felt, and dryer adjustments.

(2)—Machine direction variations.

(a) Short term.

Short term machine direction variations can be very significant and very difficult to cope with. They are caused by mechanical problems with the wet end (unbalanced table tolls, vibrating head boxes, eccentric presses, etc.), or by hydraulic problems with stock supply system (surges in pumping lines, varying tank levels, etc.) Most short term variations are cyclical in nature, and may have a range of frequencies from 40 cps. to 4 per hour. They may be quite extreme; and, in some cases, may approach 15 per cent of basis weight.

Variations of this sort are completely uncontrollable; and, certainly, the very short ones are unmeasurable with the A-B-C system. They can only effectively be controlled by tracing their origin and eliminating them at their source-end. The A-B-C system will assist the mill personnel to effect improvements in the short term machine characteristics.

In normal operation, the high frequency fluctuations are averaged out by the A-B-C system, and they do not affect the overall operation.

(b) Long term.

In most news machines, there are long term drifts that are noncyclical in nature and extremely difficult to trace and rectify. They may be caused by a myriad of changing conditions from machine speed changes to inadequate stock chest agitation, and are usually quite controllable with the A-B-C system. Charts taken from a Betameter on a high speed news machine show the extent of these drifts, which, as they amount to 5 lb., can be quite significant. The A-B-C system with its high measurement accuracy can control these drifts to .30 lb.

It appears that the A-B-C system can substantially improve across machine and machine direction variations. It should be possible to increase the average moisture content to produce paper in which the moisture peaks have approximately the same per cent moisture as the original paper. To obtain the same maximum moisture content, the average could thus be increased while the fiber basis weight would be simultaneously decreased.

The amount of money involved in this change depends on how the decrease in basis weight is achieved. If the machine is presently dryer limited, the basis weight can best be decreased by a slight increase in speed. If this is possible, then the production of the machine has been increased by this amount with no increase in stock consumption. If, on the other hand, it is impossible to increase speed even by a slight amount, the basis weight must be decreased by reducing the stock flow to the machine. Under these circumstances, the machine production remains constant while less stock is used —and the stock saving is equivalent to the percentage reduction in fiber usage. There would also be some steam savings on this basis, since less water is removed in the dryer.

Application to Other Grades

Generally, these arguments hold true for other grades of paper with some exceptions. In the fine paper field, for instance, there is no desire to crowd the very limit of top moisture content or of bottom basis weight specification. However, here the increase in uniformity pays off as a quality improvement, and quality is the most important single characteristic of the sheet. Also, since the raw stock value is proportionally very high, a reduction in grade change time can be a considerable item.

On the other hand, with grades sold on an area basis, such as corrugating medium and some paperboard, there is a real opportunity to lower the average fiber weight and raise the average moisture level (which may well be accompanied by fewer dryer breaks and a stronger and more valuable product to the consumer) and so create bountiful savings.

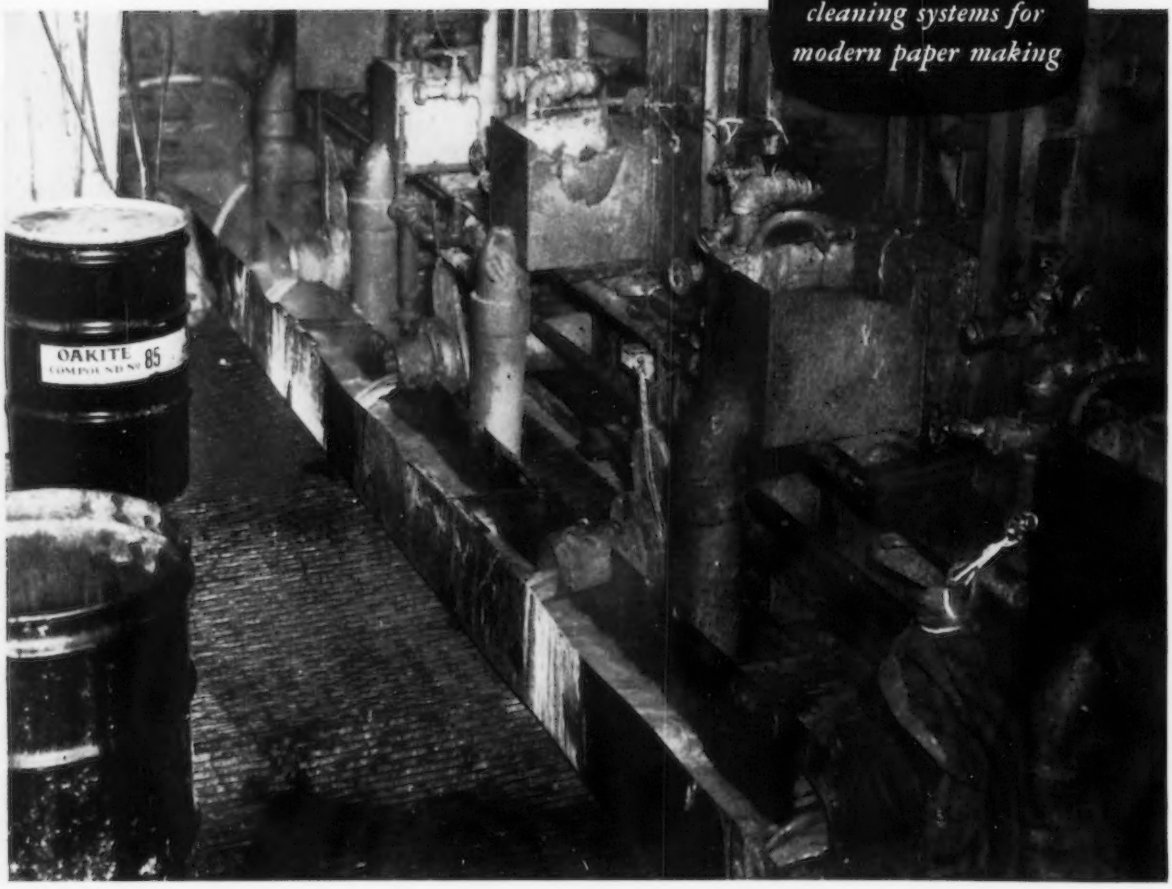
Economic Evaluation of the A-B-C System

In an effort to remove the burden of statistics gathering from an evaluation of the A-B-C system, a two-channel, five-band production analyzer is ordinarily provided. By counting units of production in segregated groups, the computation of improvements is easily done; and comparisons are clearly and accurately drawn.

When installation is made, and all adjustments and calibrations completed, the use of automatic control is delayed for a period of 30 days, during which time the machine operators can familiarize themselves with the unit and its abilities. Considerable improvement is to be expected during this time; and the analyzer will be totaling the results. At the end of the acclimatization period, the system is put on control, and now further improvement is apparent. Occasionally, the entire control system is suspended, and all recorders masked off with only the analyzer ticking away. These results, added to comparisons of regular mill records, form the basis for a complete economic evaluation report —normally extending over a period of six months or more. It is to be expected that the A-B-C system will yield a net annual rate of return after taxes and depreciation in excess of 35 per cent, and often of 50 per cent, or more.

Based on a paper presented at the 1957 fall meeting of the Northwestern Division of the American Pulp and Paper Mill Superintendents at Duluth, Minn.

Modern cleaning systems for modern paper making



Mill Cuts Roll Cleaning to ½ Hour With Oakite "Automated" Cleaning

Build-up of asphalt, tar, hard-water scale and resins on the rolls of one rough sheet mill took sixteen man-hours of tedious wire brushing to clean. Still, some soil remained, causing cockeling and frequent wraparound.

Now, all soil is removed from cylinder, couch, press and control rolls with virtually *no* time out.

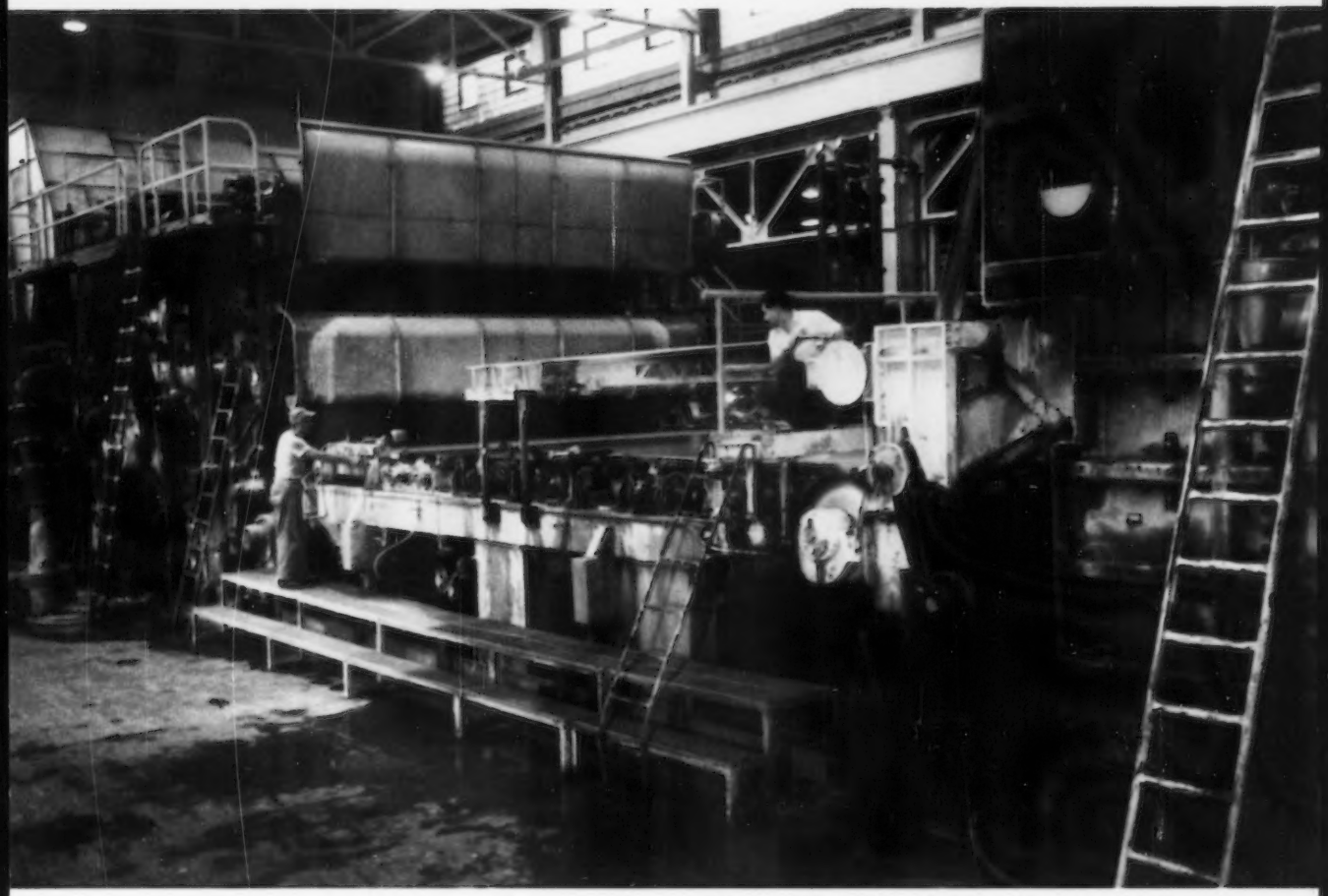
How was it done? On recommendation of the Oakite man, the mill installed shower heads above each cylinder roll. A solution containing Oakite Compound No. 85, is mixed in the water tank, heated and sprayed on rolls. The moving felt transfers the solution from cylinder to couch and press rolls. Overflow, caught in a removable trough, is recirculated. In half an hour, rolls are *thoroughly* clean.

Call the Oakite man for an engineered cleaning program that takes in everything from wet end to dry end. See how *you* can reduce downtime . . . get better cleaning results . . . save money on maintenance cleaning. Call the local Oakite man, or send for Bulletin F-4647. Oakite Products, Inc., 48A Rector Street, New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS · METHODS · SERVICE
SCIENCE
In our 50th year

Modern Cleaning Systems Keep Downtime DOWN

Export Division Cable Address: Oakite
Technical Service Representatives in Principal Cities of U. S. and Canada

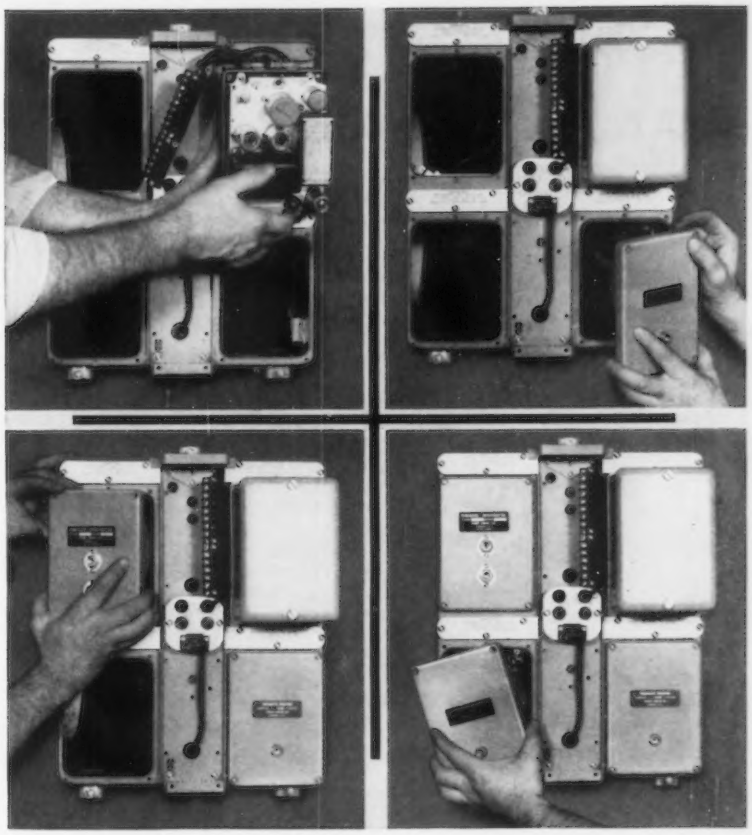


Green Bay Plant, No. 9 Machine, Green Bay, Wis. Photo by J. W. Miller

Marathon—a division of American Can Company

This 192″ Yankee tissue machine is the fastest and most modern in the growing and diversified Marathon organization. The first Beloit machine was installed in this mill in 1904. Today, this modern plant has nine Beloit machines in production.—"*Your partner in papermaking,*" *Beloit Iron Works.*

CUSTOM BUILD your own Bailey Recorder



These four views of the back of a Bailey Recorder show how four plug-in units may be added as needed to meet almost any recorder application.

The freedom and flexibility of "do-it-yourself" instrumentation is yours in the Bailey Recorder. A variety of plug-in units make it possible to record, control, and retransmit any variable that can be converted to a pneumatic or electric signal.

The basic plug-in units are the Bailey a-c and d-c Electronic Receivers and Pneumatic Receivers. Any four of these may be used in one recorder, intermixed in any way, to provide four continuous records on one chart.

For automatic control, other plug-in units are available.

For square root extraction or linear integration, there are two plug-in variations of the Bailey Integrator.

When you want a pneumatic signal that varies according to a pre-set pattern plug in a Bailey Program Controller.

Periodic running time of a condition or process is recorded on the chart when a Bailey Running Time Recorder is used.

These and other plug-in units are described in Product Specification E12-5. Some companies stock Bailey Recorder cases and assorted plug-in units. As instrumentation and control needs arise they build up the kind of recorder-controller required, using the proper plug-in units from stock. Unmatched versatility such as this means lower instrumentation costs.

For the complete story of how easily you can custom build this recorder to your needs, see your Bailey Engineer. G43-1

BAILEY METERS

Instruments and controls for power and process

BAILEY METER COMPANY

1056 IVANHOE ROAD • CLEVELAND 10, OHIO

In Canada—Bailey Meter Company Limited, Montreal

HUYCK FELT

THE GARDNER BOARD AND CARTON CO.
GENERAL OFFICE
MIDDLETOWN, OHIO
PLANTS: MIDDLETOWN, OHIO — LOCKLAND, CINCINNATI, OHIO

Lockland, Cincinnati 15, Ohio

June 24, 1957

Mr. Fredric A. Soderberg

Dear Dean:

After a busy week back on the job, I now find time to write you a few lines.

No doubt you people at Huyck are wondering what your students got out of the Felt Workshop.

To me it was quite an experience to see the processing of a felt from start to finish, the sorting of the wool, the cleaning process, and the weaving of the wool, the things I saw, plus the excellent lectures we had on the different phases of the use of felts and the knowhow of making felts plus the knowledge that your people have of the papermakers' problems, left quite an impression on me. All in all, I think it was a job well done, and not to mention Huyck's wonderful hospitality would be a sin.

I wish you would extend my sincere thanks to all of your people for the courtesies shown me during the week I attended the Felt Workshop, both in the conference room and at play in which your people did an excellent job.

Thanking you once again for your invitation to the Felt Workshop and the courtesies shown me during my stay in Albany.

Yours truly,

Andrew J. Westendorf, A.F.T.
Superintendent, Board Mill
Lockland Division

ACME PAPER PRODUCTS COMPANY LIMITED

HEAD OFFICE 188 CARLAW AVENUE TORONTO CANADA TELEPHONE HOWARD 1-1161

October 31st, 1957

F. C. Huyck & Sons,
Rensselaer,
New York.

Attention: Mr. F. A. Soderberg

Dear Fred:

Please forgive my delay in thanking you for the favours received before, during and after your Third Felt Work Shop.

I would like to assure you that not only do I think your Work Shops a great success but that they are of much benefit and practical use to men in my position. Having had time to really assess the value of each subject I must admit each phase held my undivided attention and that your faculty presented each lesson so that all students received a valuable and useful insight into the manufacture and use of paper machine clothing.

Again I would like to thank you personally and all your colleagues at F. C. Huyck for the wonderful hospitality extended to me during my visit.

Yours very truly,
ACME PAPER PRODUCTS COMPANY LIMITED

P. Bell
Mill Superintendent

PBiaa

the co

APPLIED FELT

HUYCK MEMO

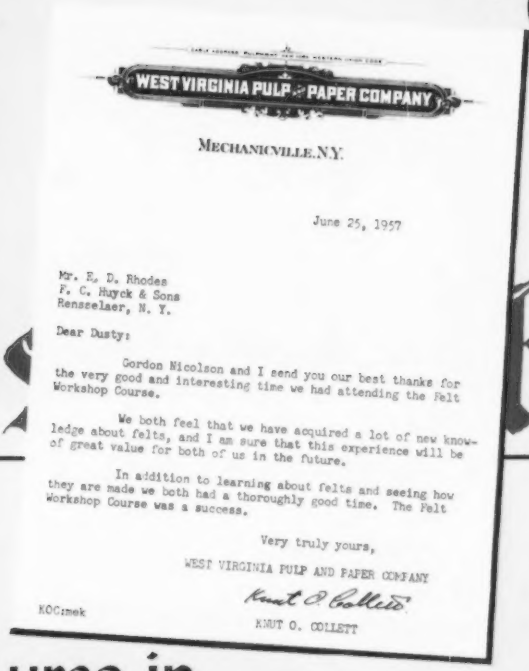
Do you have an interest in felt operation in your mill? If so, write today for the complete story of the Huyck Felt Workshops and schedule for 1958. Better sign up early, too, and reserve the session you prefer.

HUYCK FELTS

Huyck Felt Co.,
Rensselaer, N. Y.;
Aliceville, Ala.;
In Canada: Kenwood Mills Ltd.,
Arnprior, Ontario.

Division of F. C. Huyck & Sons

WORKSHOPS



WEST VIRGINIA PULP AND PAPER COMPANY

MECHANICVILLE, N.Y.

June 25, 1957

Mr. E. D. Rhodes
F. C. Huyck & Sons
Rensselaer, N. Y.

Dear Dusty:

Gordon Nicolson and I send you our best thanks for the very good and interesting time we had attending the Felt Workshop Course.

We both feel that we have acquired a lot of new knowledge about felts, and I am sure that this experience will be of great value for both of us in the future.

In addition to learning about felts and seeing how they are made we both had a thoroughly good time. The Felt Workshop Course was a success.

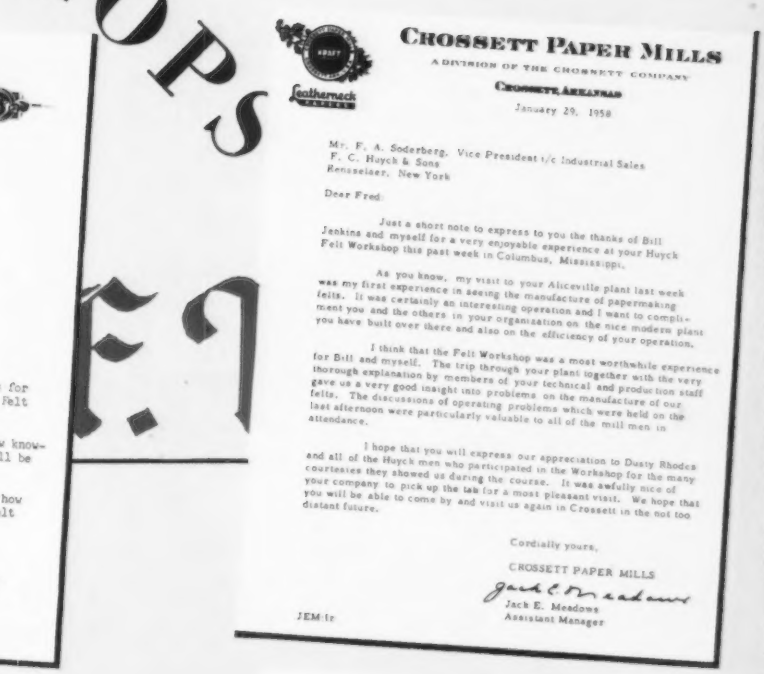
Very truly yours,

WEST VIRGINIA PULP AND PAPER COMPANY

Knut O. Collett

KOC:mek

KNUT O. COLLETT



Featherweight Wringers

CROSSETT PAPER MILLS

A DIVISION OF THE CROSSETT COMPANY

CROSSETT, ARKANSAS

January 29, 1958

Mr. F. A. Soderberg, Vice President i/c Industrial Sales
F. C. Huyck & Sons
Rensselaer, New York

Dear Fred:

Just a short note to express to you the thanks of Bill Jenkins and myself for a very enjoyable experience at your Huyck Felt Workshop this past week in Columbus, Mississippi.

As you know, my visit to your Aliceville plant last week was my first experience in seeing the manufacture of papermaking felts. It was certainly an interesting operation and I want to compliment you and the others in your organization on the nice modern plant you have built over there and also on the efficiency of your operation.

I think that the Felt Workshop was a most worthwhile experience for Bill and myself. The trip through your plant together with the very thorough explanation by members of your technical and production staff gave us a very good insight into problems on the manufacture of our felts. The discussions of operating problems which were held on the last afternoon were particularly valuable to all of the mill men in attendance.

I hope that you will express our appreciation to Dusty Rhodes and all of the Huyck men who participated in the Workshop for the many courtesies they showed us during the course. It was awfully nice of your company to pick up the tab for a most pleasant visit. We hope that you will be able to come by and visit us again in Crossett in the not too distant future.

Cordially yours,

CROSSETT PAPER MILLS

Jack E. Meadows

Jack E. Meadows
Assistant Manager

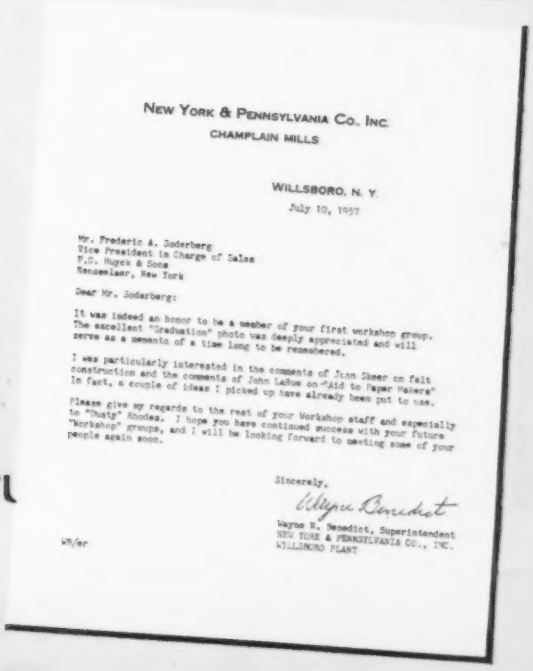
JEM:lr

urse in

TECHNOLOGY

F. A. Soderberg

Chairman, Board of Tru



NEW YORK & PENNSYLVANIA CO., INC.

CHAMPLAIN MILLS

WILLSBORO, N. Y.

July 10, 1957

Mr. Frederic A. Soderberg
Vice President in Charge of Sales
F.C. Huyck & Sons
Rensselaer, New York

Dear Mr. Soderberg:

It was indeed an honor to be a member of your first workshop group. The excellent "graduation" photo was deeply appreciated and will serve as a memento of a time long to be remembered.

I was particularly interested in the comments of Jean Skeer on felt construction and the comments of John LaRue on "Aid to Paper Makers". In fact, a couple of ideas I picked up have already been put to use.

Please give my regards to the rest of your Workshop staff and especially to "Dusty" Rhodes. I hope you have continued success with your future "Workshop" groups, and I will be looking forward to meeting some of your people again soon.

Sincerely,

Wayne Benedict

Wayne H. Benedict, Superintendent
NEW YORK & PENNSYLVANIA CO., INC.
WILLSBORO PLANT

wh/er

PROOF that Fortified DYLEX® K-52 gives coated paper outstanding pick resistance!

THE PIGMENT BINDING STRENGTH of new DYLEX K-52—a *Fortified* styrene butadiene latex made by Koppers—was tested on this I. G. T. Printability Tester. The paper strip was a standard letterpress stock coated with DYLEX K-52. A #3 tack-grade ink was used; and the test was run at a speed equivalent to a press speed of 640 fpm.

The results speak for themselves. There isn't a sign of picking on the sample. The ink did not affect the coating; it printed smoothly and evenly. Other latices picked severely when subjected to the same test.

In addition to superior resistance to picking, new DYLEX K-52 produces coating colors with good adhesion and flow properties because of its fine particle size. It is compatible with starch, dextrin and protein adhesives commonly used. It may be used with a variety of pigments on all types of coaters.

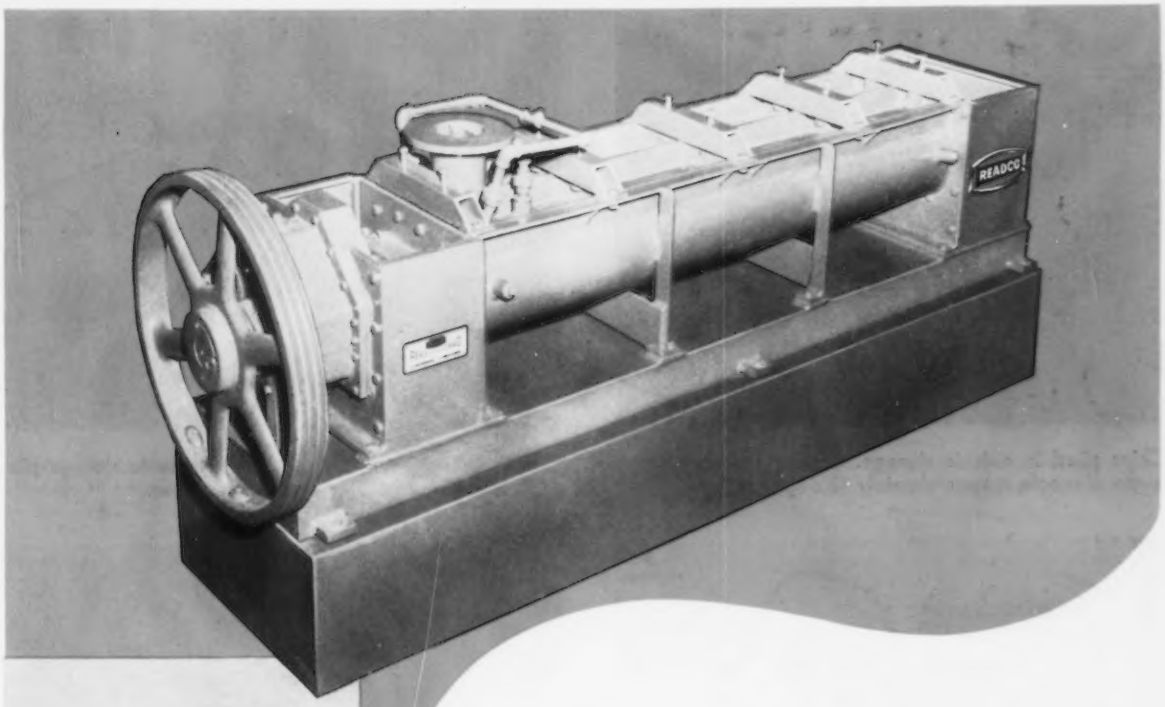
Write for complete technical information and a test sample of new Fortified DYLEX K-52. Koppers Company, Inc., Plastics Division, Dept. PTJ-38, Pittsburgh 19, Pa.

TWX Call Number . . . PG533

Offices in Principal Cities • In Canada: Dominion Anilines and Chemicals Ltd., Toronto, Ontario

KOPPERS

KOPPERS PLASTICS



READCO

3 CUBIC FEET A MINUTE

Perfectly Mixed!

Speed production, lower costs...automatically with Readco Continuous Double Arm Mixers

You can step up production and reduce costs of processing dense and viscous materials with this rugged Readco mixer. Built for continuous, automatic operation, it will turn out ½ to 3 cubic feet per minute . . . in a completely homogeneous mix.

Overlapping action of mixing paddles fully disperses ingredients while moving them along to discharge. Temperature controlling jackets for heating and cooling are standard equipment.

For further information on Readco mixing equipment, see Chemical Engineering Catalog pages 1483 to 1490.

Whatever the mixing job: a READCO mixer!

READ STANDARD
York, Pennsylvania
A Division of
Capitol Products Corporation

Chips piled in outside storage. Check of picture shows angle of repose is approximately 43 degrees.

Chips being blown through 10-inch pipe to storage pile. Chips are pushed from sides into hopper.

Unloading a chip barge. Barges contain from 200 to 1,100 cord equivalents, are unloaded by 10-inch suction pipe.

Converted rail cars used for transporting chips. Note truck van (left) which also delivers chips to chip storage.

Storage of Chips in Outside Piles

J. S. Hensel

Forest Engineer
American Pulpwood Assn.

This report has been prepared in response to several inquiries for more information on the subject of storing pulpwood chips in outside piles. Interest stems from the potential savings which might result through reduced wood deterioration in storage, lower handling costs, and the possibility of storing a larger wood volume per square foot of ground surface area. Several West Coast pulp and paper mills which are actually following this practice were contacted in order to provide this information.

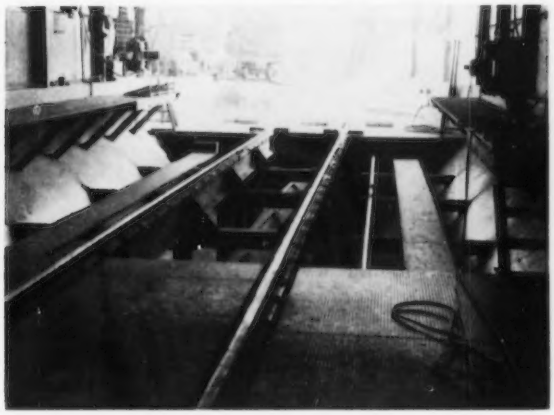
Information for preparation of this report was furnished by Phil S. Simcoe, wood technologist, Crown-Zellerbach Corp., Port Townsend, Wash., and Avery Cloninger, manager, chip department, Longview Fibre Co., Longview, Wash.

Delivery to Mill

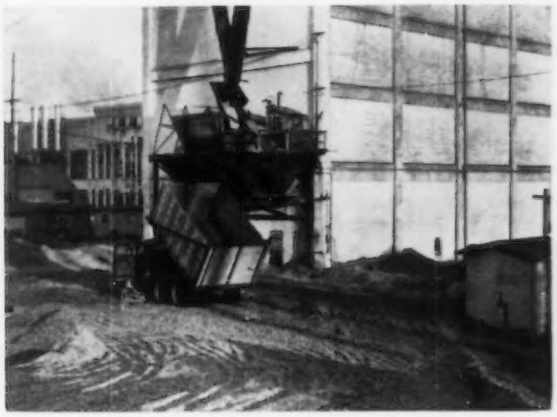
Wood chips are delivered to West Coast mills either by truck, rail or barge. Truck-trailer van units generally average between 8 and 12 cord equivalents per load. Converted open-top side or bottom discharge railroad cars average between 18 and 30 cord equivalents, depending upon the size of the railroad car. A considerable variation in chip capacities of barges was noted and volumes ranged from 200 to 1100 cord equivalents depending upon the size of the barge used.

These chip storage piles are built on macadam base instead of hogged fuel base which is often used.

Chip storage pile. Note compaction in center area resulting from dump trucks traveling to and from pile top.



Rail chip unloading platform. Either side dump or bottom dump rail cars are unloaded here.



Dump trucks convey to and from outside storage. Hopper receives chips from barges, delivers into dump trucks.

The most common method encountered for unloading truck-trailer van units was the 4-legged steel tower and electric hoist which elevates the front end of the van with the chips then sliding into a hopper. Some of the vans being used were equipped with their own self-contained conveyor which carried the chips out of the rear end of the van and directly into a chip receiving hopper.

Railroad cars used for chip delivery were either of the side or bottom dump type with the top either open or closed. Discharge of chips is generally into a rail pit or unloading platform with a conveyor in the bottom. Car shakers applied to the sides of the rail cars help to hasten chip discharge. Some rail cars are equipped with V-shaped separators running lengthwise of the car. These separators or plows may be moved sideways in either direction to facilitate unloading.

An author of a recent article (Eberhardt in March 10, 1958) suggested that mills in other cities should consider the West Coast practice of storing wood in chip form in outside piles. We are therefore pleased to be able to promptly bring this information on the subject to our readers.

Barge unloading is accomplished either by Gantry crane and bucket or by suction pick-up. In one instance, a small rubber-tired bucket-type loader was lifted into the barge in order to concentrate chips for the crane bucket.

Piling and Recovering Chips

Delivery of chips to storage piles varied considerably depending upon mill layout, available facilities, and the various locations of delivery points and storage areas. In one instance, transportation of chips involved suction from barges, belt conveyance to a dump truck hopper, and finally dump truck delivery up and on the chip storage piles. Obviously a choice of one or a combination of transport facilities would be dictated by the over-all mill and yard layout prevailing at any one particular mill.

Chip piles are generally separated by species or groups of species receiving common usage. Species most commonly used in the survey area were Douglas fir, western hemlock, white fir, red alder, cottonwood, western red cedar and lodgepole pine.

Methods of recovering or reclaiming chips from the outside storage piles also

vary considerably. In one case, a stand-by track-type loader was used for loading dump trucks, which in turn delivered their loads of chips to a hopper. From the hopper, a belt conveyor transported the chips either to chip silos or directly to the digesters. In another instance, a dozer-mobile was used to push the chips into a chip hopper. Suction or vacuum type recovery was also applied in picking up chips from outside storage piles.

Chip Storage Areas

Outside chip storage piles are either directly on the ground, on bases constructed of a layer of hogged fuel, or as in one instance, on a storage yard which was macadamized prior to chip storage. It is generally agreed that careful attention be given to the location of outside chip storage with respect to fly ash, dirt, dust or other types of wind-born deposits.

Pile Compacting

In one instance a pile of wood chips covered 11.60 acres and contained slightly less than 113,000 cord equivalents. A careful physical inventory revealed 102,000 cord equivalents. Using a ten per cent compaction figure, determined from careful previous studies, the book inventory of slightly less than 113,000 cord equivalents was quickly determined to be correct.

It is reliably reported that a compaction of approximately ten per cent results when trucks or tractors travel over a chip storage pile. This same compaction per cent applies when chips are air-pressured into storage piles. Compaction resulting from simple gravity discharge to chip pile is reported as rarely exceeding one per cent compaction.

Chip Deterioration

Some very interesting information was obtained relative to the lack of deterioration in outside chip storage piles. Recent tests indicate that chip piles containing species indigenous to the West Coast pulpwood industry may be left intact for as long as three years without serious deterioration. One test made on a chip pile base which consisted of hogged fuel and which had been laid down approximately four years did reveal some saprophytic fungal mycelium. Resultant tests on these activated chips obtained from the chip pile base did indicate low-strength pulp. The problem of deterioration while fairly well determined for West Coast species obviously required additional investigation. It is possible that such species as the southern pines, northern hardwoods, or aspens may react in much the same manner when stored in chip piles outside. Positive conclusions can only be determined by careful testing of the desired species.

Moisture Content

Moisture content was determined to be very variable and obviously resulted from both the green quality of the wood being chipped as well as the high precipitation common to certain areas of the Pacific Northwest. The wood is usually chipped while green and piled or stored in this state. There is a high moisture accumulation in the center and bottom of the piles; however, it is not reported as being harmful or objectionable. In one instance, where a macadam chip pile base had been constructed, occasional seepage or run-off did occur.

Outside Chip Pile Temperatures

Continuous testing disclosed that the temperature never exceeded 110° Fahrenheit and oddly enough this maximum was recorded on the very top of the pile. Temperatures ranged in the low 80° Fahrenheit vicinity as the pile was being built. Eventually this inside temperature recedes to 50° with only a 1 to 2°F. fluctuation. Freezing temperatures sometimes tend to ball-up chips in rather large masses. Minimum temperatures are reported at 10°F.; however, limited experiences in colder sections of the United States fail to indicate serious problems in this respect.

Fire Prevention

Smoking is positively forbidden on or near the piles. Fire lines and hose are laid around and over to chip storage piles. For the past 5 years, no fires have been reported. It is necessary to keep the chips essentially free of metal, bark, and other foreign substances in order to maintain the temperatures which are reported here. No attempt is made to wet down the chip storage pile.

Chip Handling Costs

In one instance a cost of $1.25 per cord equivalent applied to a round trip from barge to chip pile and back to the digesters. In this case, chip hauling from chip hopper to chip pile storage and ultimately back to the chip hopper cost 75 cents per cord equivalent. The remaining 50 cents per cord equivalent cost applied to barge labor, suction, conveyance, labor on outside piles, and hopper tenders. Where rail delivery was involved, a cord equivalent cost of 66 cents was incurred for conveyance from rail car unloading platform and then by air pressure delivery to the chip storage pile. Actual cost of car unloading was reported at approximately 62 cents per cord equivalent. In this instance, reclaiming cost about 34 cents per cord equivalent and was accomplished by dozer-mobile to a hopper and belt conveyance into the mill system.

Pile Volume Determination

It is difficult to assess clearly the volume of chips which may be stored on a given area. Such variables as size and shape of the bases of chip piles, variations in height, and compaction per cents make a straight-line ratio application impossible. The Prismoidal formula is commonly accepted by engineers as the most applicable for determining volumes contained in piles of loose, bulk material.

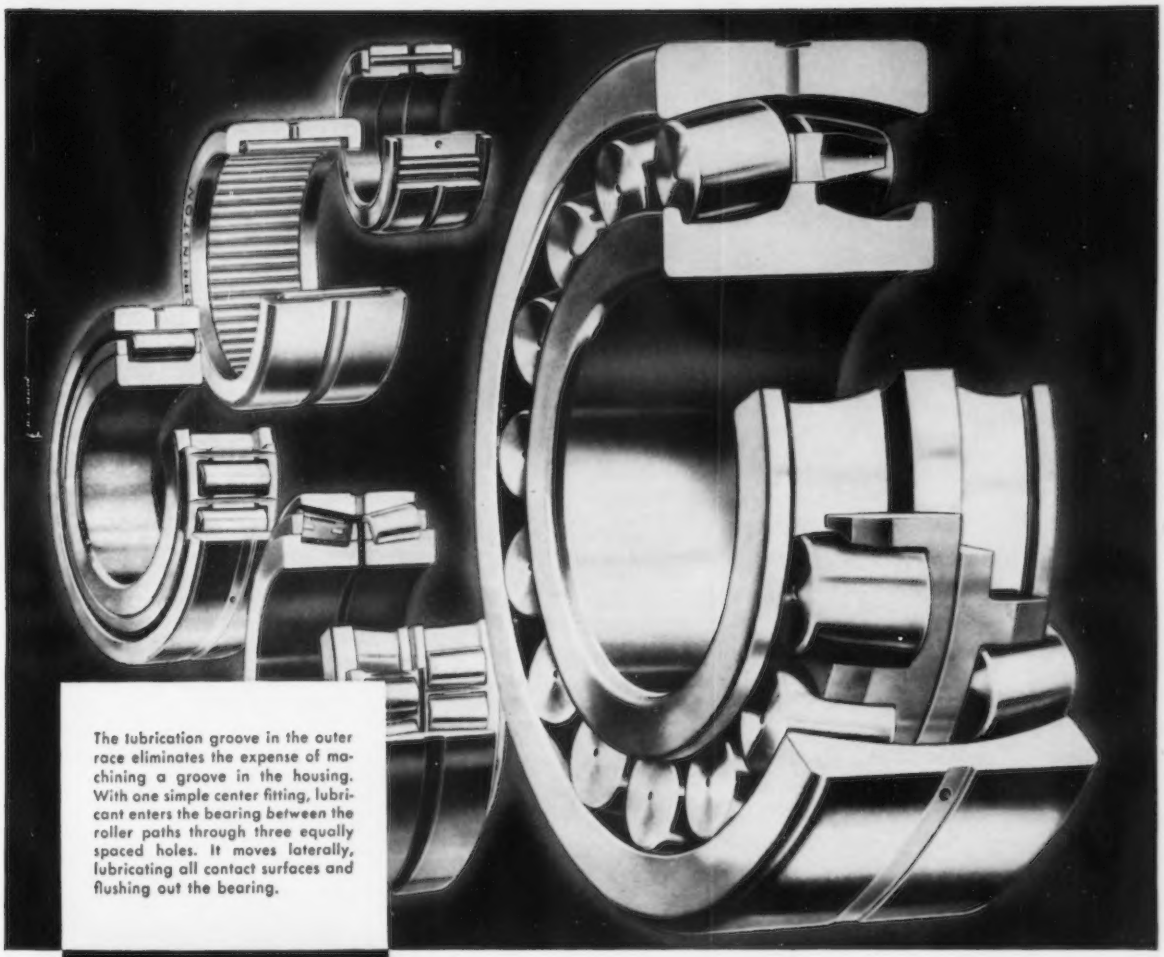
Conclusion

Deterioration in the storage of pulpwood represents a great dollar loss in raw material for the industry. Outside storage of this raw material in chip form is one highly promising method of minimizing this problem. While many West Coast species have been stored for periods up to three years without serious deterioration, such a condition may not apply to other commercial pulping species. Only careful testing and research relating to individual species will reveal their outside chip storage potentials.

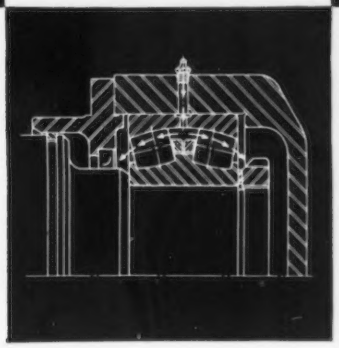
It is perhaps reasonable to predict lower handling costs for chips as contrasted with the handling of wood in the round or bolt form. Such a viewpoint is analogous with the reduced handling costs of other types of bulk materials as experienced by other industries. Here again due to many and varied types of mill layouts, what may well be food for one might be poison for another.

Greater volume storage for each square foot of ground surface area is possible, through higher pile storage. Using a known mill yard area and the accepted angle of repose, the chip-cord carrying capacity of any mill yard can be quickly and easily determined. The handling and storage of chips in outside piles has now progressed from the embryo stage and obviously is worthy of optimistic surveillance by other companies.

Based on American Pulpwood Assn. Equipment Handbook Release No. 331.



The lubrication groove in the outer race eliminates the expense of machining a groove in the housing. With one simple center fitting, lubricant enters the bearing between the roller paths through three equally spaced holes. It moves laterally, lubricating all contact surfaces and flushing out the bearing.



A time-proved lubricating method now available on Torrington Spherical Roller Bearings

The circumferential groove in the outer race has met the test of experience in many Torrington Bearings, including Heavy Duty Needle Bearings, Aircraft Type Needle Bearings, Tapered and Radial Roller Bearings. Now the circumferential lubrication groove is available in Torrington Spherical Roller Bearings.

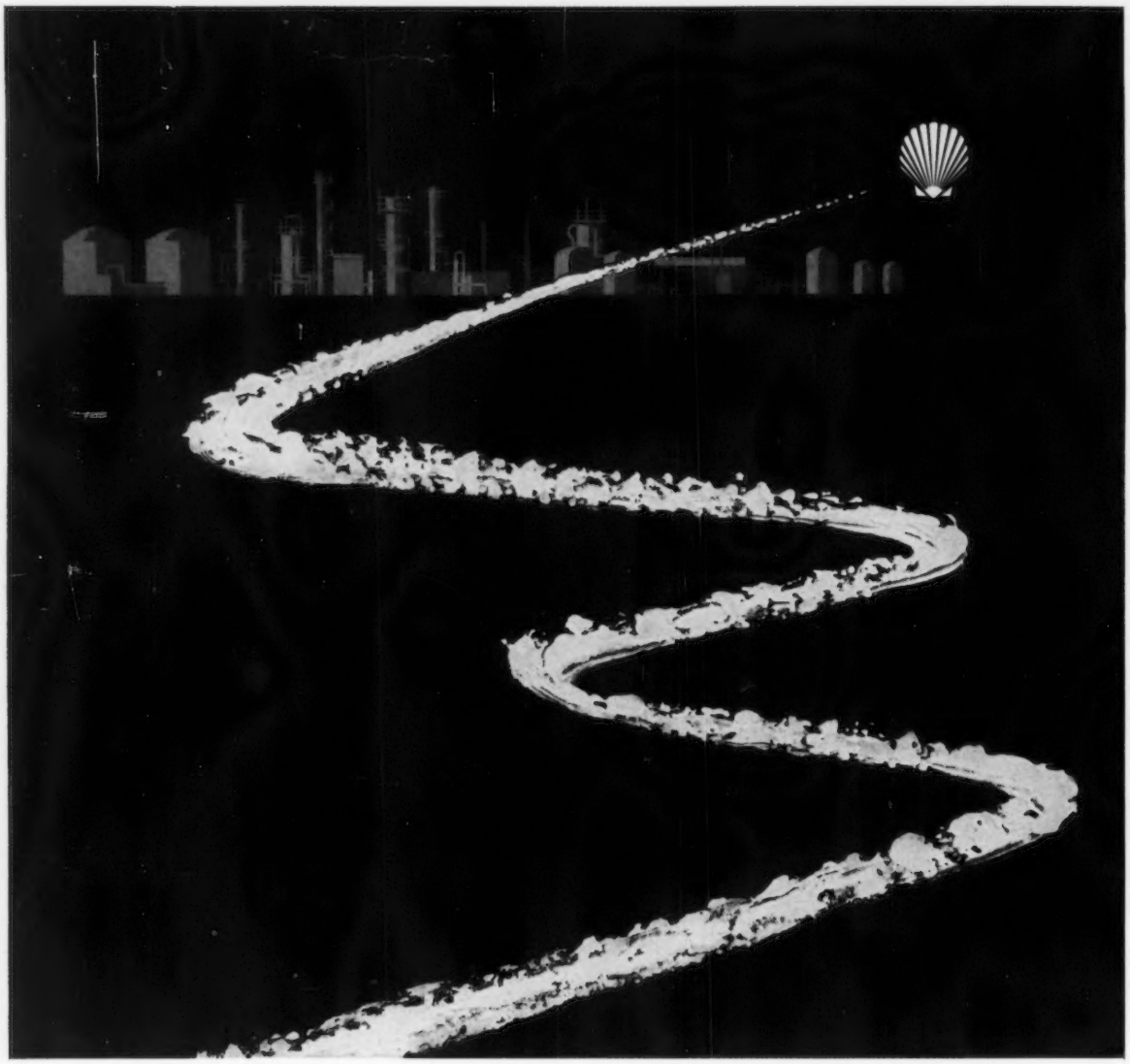
This design feature makes it possible to introduce lubricant *between* the roller paths without the expense of machining a groove in the housing. This groove is proportioned to provide generous lubricant flow capacity. Lubricant moves through the roller paths, flushing used lubricant and contaminants away from bearing contact surfaces.

Torrington Spherical Roller Bearings in many sizes may be ordered with this groove as desired at no additional cost. For further information, see your Torrington representative or write: **The Torrington Company, South Bend 21, Ind.–and Torrington, Conn.**

TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • NEEDLE • BALL • NEEDLE ROLLERS • THRUST



New H_2O_2 Shell Chemical Plant now on stream At Norco, Louisiana

With a multi-million pound capacity, this new Shell Chemical plant now takes its place as an important source of high-purity hydrogen peroxide.

Deliveries are now being made from Norco in drum to tank-car quantities.

To help you with your H_2O_2 application and handling problems, Shell Chemical maintains a very active research program and a field service to render expert technical assistance to processors. As a major consumer of hydrogen peroxide, Shell has acquired extensive experience in the special problems of H_2O_2 chemistry.

Your Shell Chemical representative will be glad to consult with you on your own H_2O_2 requirements.

Write to:

SHELL CHEMICAL CORPORATION

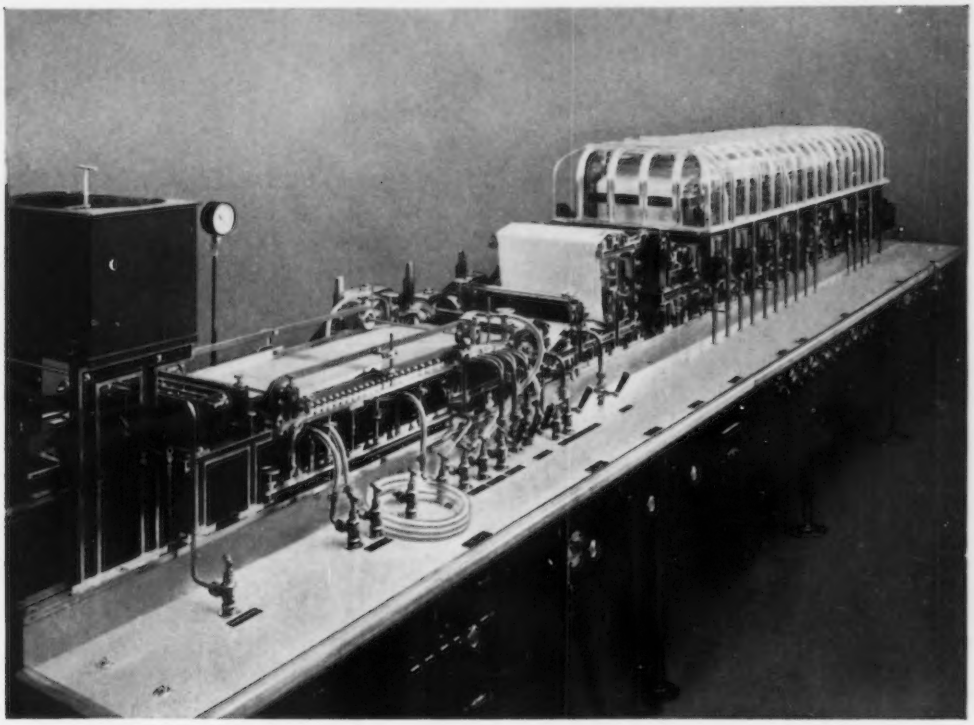
CHEMICAL SALES DIVISION

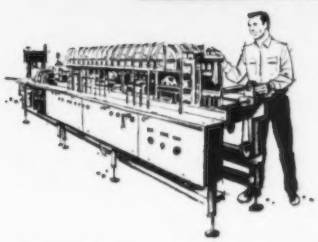
Atlanta • Boston • Chicago • Cleveland • Detroit • Houston • Los Angeles • Newark • New York • San Francisco • St. Louis

IN CANADA: Chemical Division, Shell Oil Company of Canada, Limited, Montreal • Toronto • Vancouver

SHELL

GET top quality experimental paper with NEW P & W Midget Fourdrinier Paper Machine





...and keep your full-size machines producing!

This one-man midget paper machine does a giant job of experimental paper-making the world over–serves the U.S. Bureau of Standards and other government laboratories...is favored at many leading American paper plants...and finds uses in the textile and plastics industries. All-electric operation makes it safer, cleaner, simpler than ever. Install the new P & W Midget Fourdrinier to keep your heavy equipment at profitable work while one operator—using the customary temperatures and pressures—tries out many types of paper which you can later duplicate on full-size machines.

These additional features help explain its world-wide acceptance:

Paper Quality Comparable to full-size Fourdrinier products

Weight of paper 12–120 lbs

Output Up to 3.3 lbs/hr

Speed 1.6–6.5 ft/min

Overall length 13' 1"

Overall width 32"

Working width 8-3/4"

Write for full descriptive literature—today.

PARSONS & WHITTEMORE

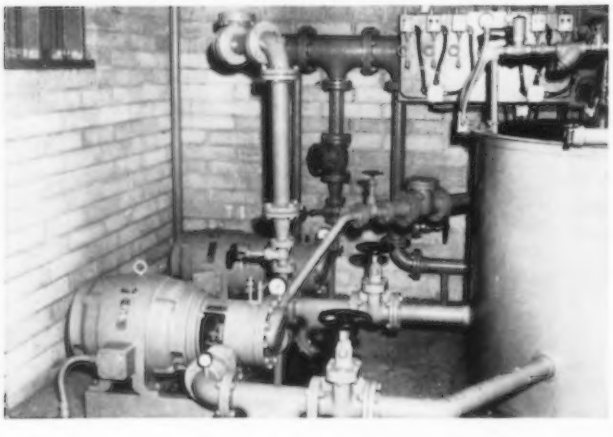
250 Park Avenue, New York 17, New York

PULP • PAPER • PAPER-MAKING MACHINERY • GRAPHIC MACHINERY

A hippo surfaces with a cavernous yawn—powered by water from F-M pumps shown below.

From butterflies to hippopotami

F-M pumps make animals "live"



In one of the world's most fabulous amusement parks, waterfalls tumble; rivers flow; hippos yawn, and giant butterflies flap their wings—all water-powered by Fairbanks-Morse pumps with F-M motors.

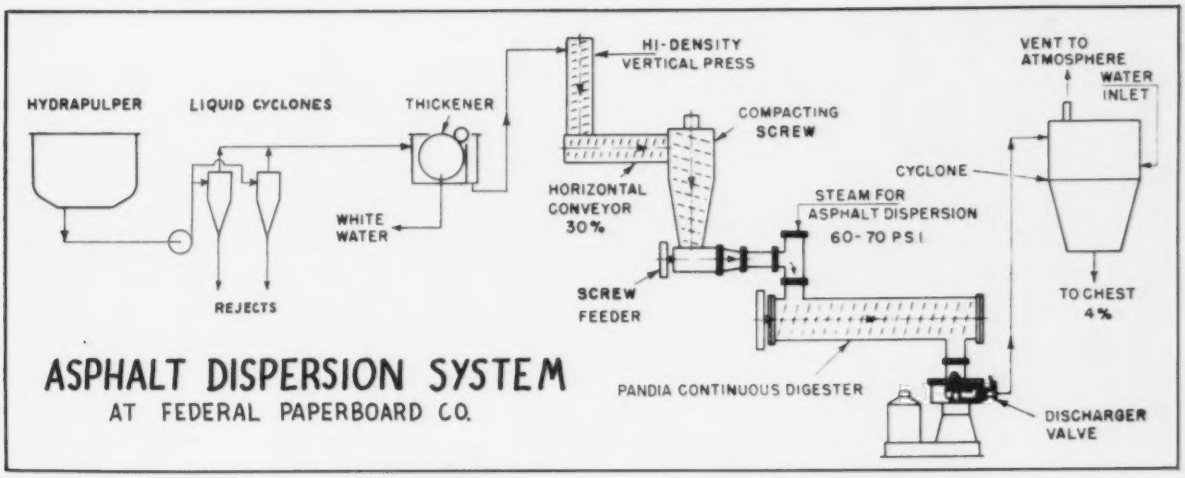
Although a most unusual application, these F-M installations demonstrate the flexibility and experience of Fairbanks-Morse in working with the engineers of any organization.

Whatever type, size or capacity pumps you need—you're sure of satisfaction when you call in your F-M Sales Engineer. Contact him today, or write directly to Fairbanks, Morse & Co., 600 South Michigan Avenue, Chicago 5, Illinois, Dept. PTJ-3-24.

FAIRBANKS-MORSE

a name worth remembering when you want the BEST

PUMPS • SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • MAGNETOS



Federal Paper Board First to Operate New Asphalt Dispersing System

Dispersion is accomplished with low horsepower and steam consumption; physical properties are not affected.

The presence of asphalt specks in board mill waste paper stock has, through the years, made the task of producing a finished sheet of quality board both difficult and costly.

A new system for relieving this asphalt problem was recently placed in operation at the Federal Paper Board Co.'s cylinder and fourdrinier board mill at Steubenville, Ohio. Known as the asphalt dispersing system, it provides for continuous heating and mechanical cleaning of the stock. It disperses asphalt and similar material into extremely minute particles which will neither clog screen and felts, or blemish the finished board. Federal Paper Board reports that the system has remarkably improved the appearance of the finished board products which the company makes for conversion into corrugated boxes and other packaging items. A. K. Freas, mill manager at Steubenville, told *Paper Trade Journal* that previously asphalt spots from ⅛-inch to 3/16-inch diameter were scattered throughout the sheet; since installation of the new system, there have been no visible asphalt spots.

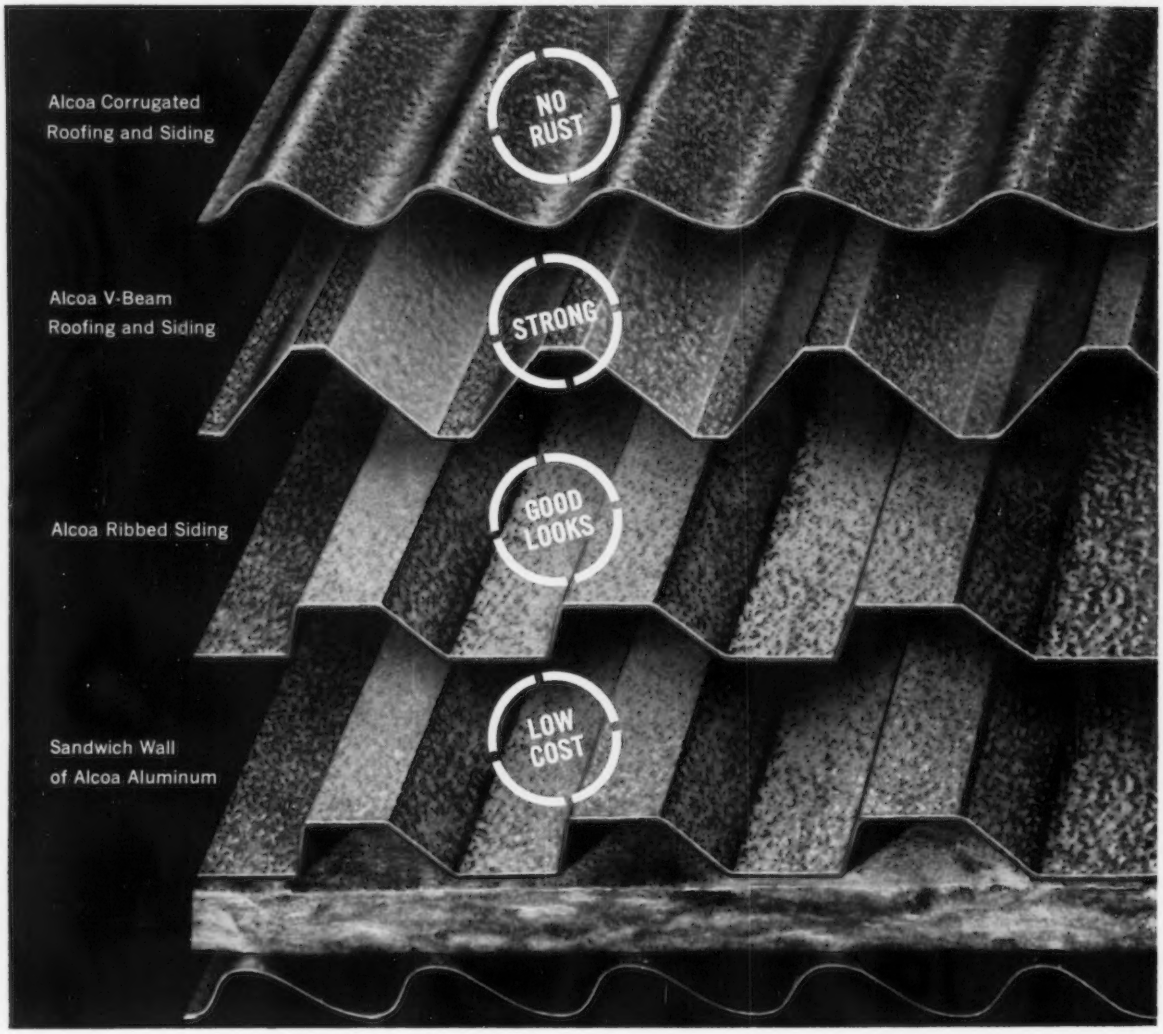
This asphalt dispersing equipment was supplied as a packaged system by the Black-Clawson Co., Shartle Division, Middletown, Ohio; and consists of a Hydrapulper, ragger, junk remover, pumps, Liquid Cyclones, thickener, dewatering press, Pandia Chemi-Pulper continuous digester, Pandia discharger, and cyclone collecting tank.

How the System Operates

The system at Federal Paper Board Co., a compact unit, operating continuously, begins with pulping of waste paper in the Hydrapulper where the ragger and junker remove some of the foreign material. Pulped stock is pumped at a reduced consistency to Liquid Cyclones where foreign material of high specific gravity is eliminated. From these centrifugal cleaners, the stock goes to a decker where consistency is increased, and next to a screw type high density vertical screw press. This raises consistency to 30 per cent. A twin screw horizontal conveyor carries the stock to a vertical compacting screw and to a continuous flight screw feeder which forces the pulp into a one tube Pandia digester tube against 60 to 70 p.s.i. steam pressure. Steam is added at several points along the length of the digester tube raising the pulp from its initial temperature of 140° F. to approximately 300° F. at the discharge end. The steam introduced to the digester raises the temperature of asphalt to its melting point, and this as well as mixing action of the screw facilitates asphalt dispersion.

From the digester tube, the stock enters the Pandia discharger through a restricted orifice that can be accurately regulated. The orifice serves to maintain pressure in the tube by minimizing steam loss at the discharge point. At the same time, a sudden pressure drop occurs as the stock is forced through the orifice. The explosive effect of the sudden pressure drop further disperses the asphalt and serves to separate the fibers.

Finally the stock is collected in a cyclone, vented to the atmosphere, and water added to reduce consistency and temperature. Consistency at this point going into the stock chest is about four per cent. The system accomplishes the dispersion of asphalt with comparatively low horsepower and steam consumption and without disturbing physical properties of the finished sheet.



Four ways to beat corrosion

with ALCOA INDUSTRIAL BUILDING MATERIALS

Alcoa® Aluminum's natural resistance to corrosion is well established. It weathers well; never needs painting. Only insignificant changes in appearance and strength occur despite the most prolonged and intensive assaults of airborne grit, organic and inorganic vapors, chemical deposits—a wide range of corrosion hazards. Years of field experience provide conclusive proof.

Your choice of building characteristics is wider with aluminum, too. Alcoa Corrugated Roofing and Siding for rustfree endurance. Alcoa Ribbed Siding for long-lasting good looks. V-Beam Roofing and Siding for high strength safely carries 30-lb/sq-ft uniform load on a 10-ft purlin spacing. And for the lowest cost insulated metal wall system known—sandwich wall of Alcoa Aluminum, with a U value of .147, has three times the insulating value of 8″ brick.

GET THIS FREE BOOK. Alcoa's free 36-page book, *Alcoa Aluminum Industrial Building Products*, gives you full technical data and background on roofing and siding. Other data is available on windows, handrails, stair treads, tread plate, gratings and similar equipment. Ask your nearest Alcoa sales office, or write Aluminum Company of America, 857-C Alcoa Building, Pittsburgh 19, Pennsylvania.

ALCOA ALUMINUM
INDUSTRIAL BUILDING PRODUCTS
ALUMINUM COMPANY OF AMERICA

Your Guide to the Best in Aluminum Value

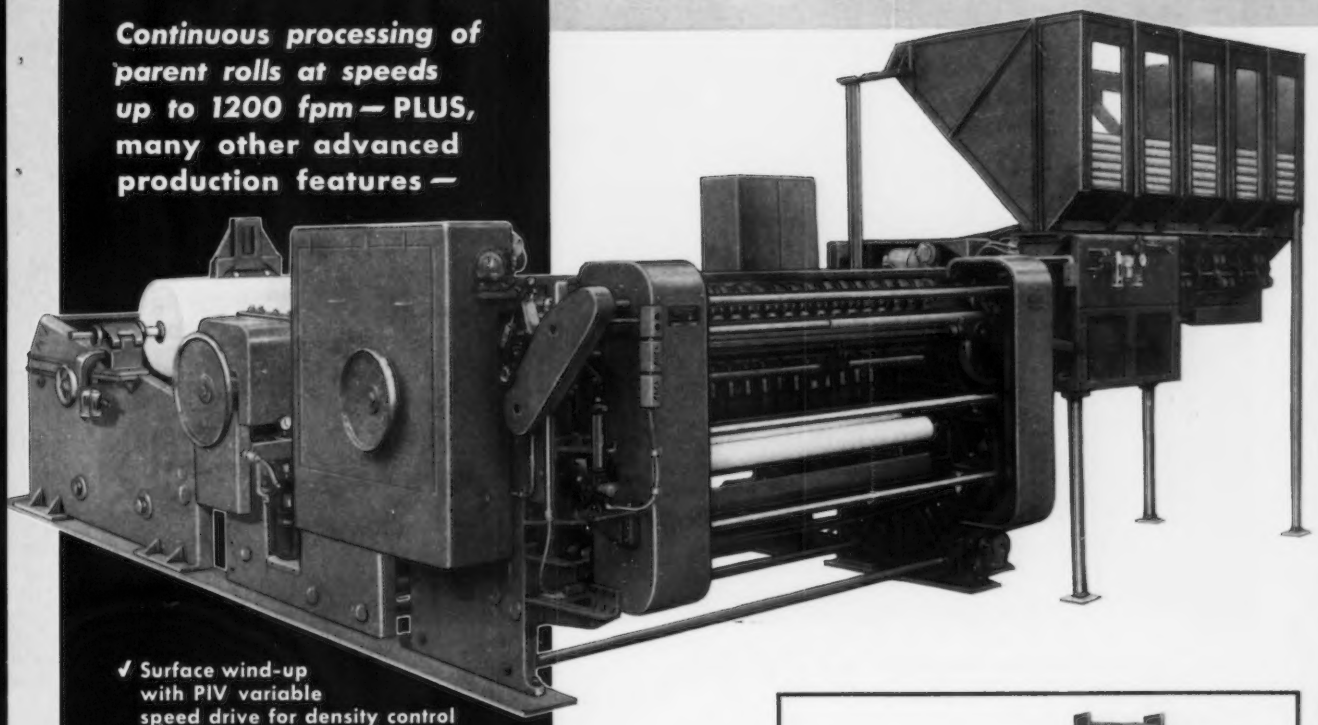
"ALCOA THEATRE"
Exciting Adventure
Alternate Monday Evenings

HUDSON SHARP's 60-B ROLL WINDER

new, improved automatic

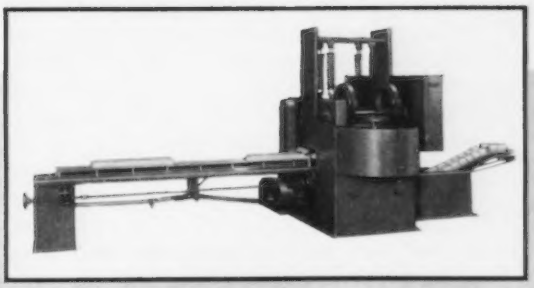
delivers facial type tissues with Clean-cut Perforations

Continuous processing of parent rolls at speeds up to 1200 fpm — PLUS, many other advanced production features —



- ✓ Surface wind-up with PIV variable speed drive for density control
- ✓ Belt driven unwind for positive tension control—less web breakage
- ✓ Does not slow down for cut-off
- ✓ Positive clean cut or conventional type sheet perforations
- ✓ Binds paper to core with cold glues—permitting economical re-use of culls
- ✓ Handles web widths up to 93"
- ✓ Accurate sheet or measured roll count
- ✓ Automatic core loading (optional) makes for complete automation
- ✓ Automatic stripping of finished rolls or logs
- ✓ Continuous trouble-free operation

The perfect production companion



Hudson Sharp Roll and Package Cutter

delivers up to 150 Rolls or Packs per minute!

Continuous running band knife operation produces toilet tissue, towel and other paper wound rolls or packs with clean cut, straight square edges—no crushing, no cuts on bias, and minimum waste at end cut trim. Economical — machine effects knife cost savings of 50% and more! Double lane production delivers 80 to 150 rolls or packs per minute, dependent upon product length. Cuts 4" to 12" in ½" increments from log girths of 4" to 5½". Ideal for continuous high speed in-line operation with Hudson Sharp's 60-B automatic Roll Winder. Get the complete facts on this highly dependable production team, today.

Putting Ideas to Work

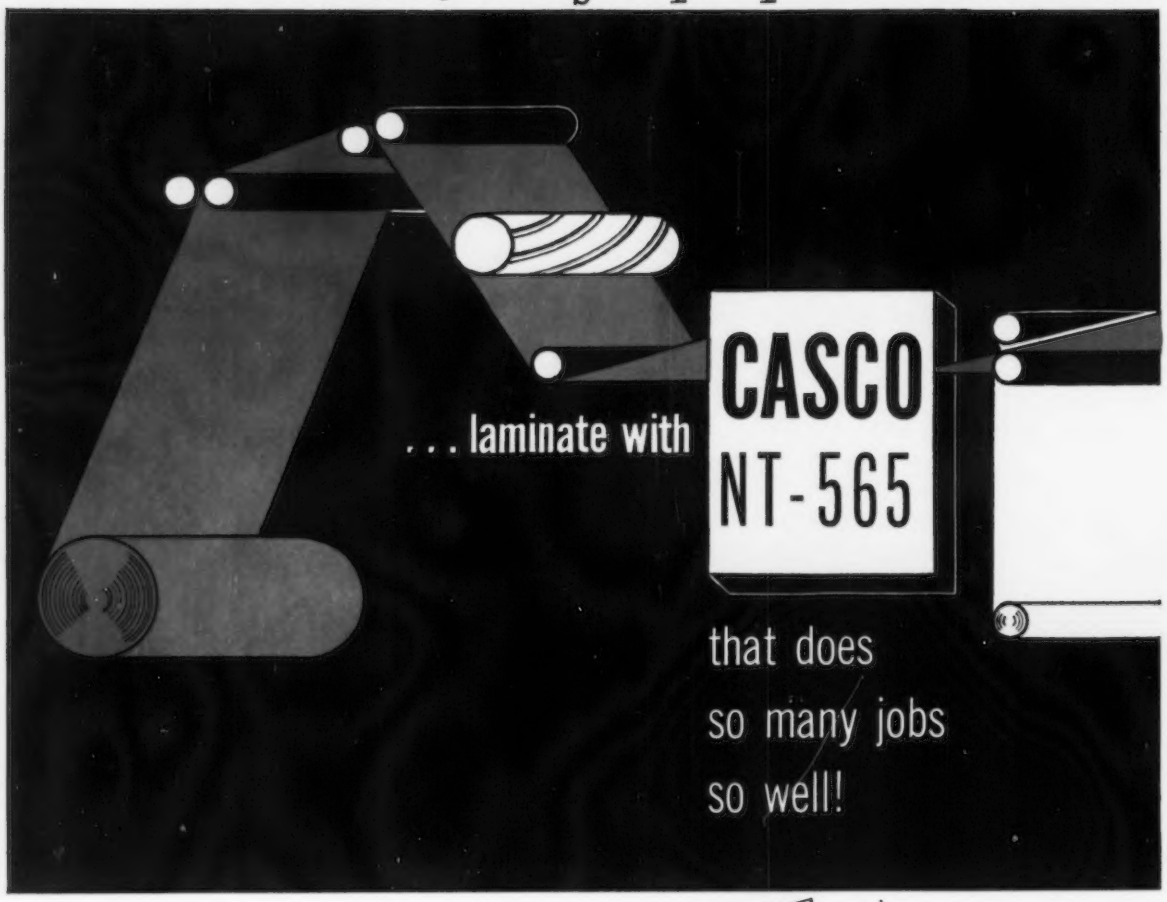
FOOD MACHINERY AND CHEMICAL CORPORATION

FMC Packaging Machinery Division

Hudson-Sharp Machine Company

1201 MAIN STREET, GREEN BAY, WISCONSIN

Don't be foiled by single-purpose adhesives!



No need to get tied up with more than one foil-laminating adhesive because you're producing different grades of paper-foil for a variety of jobs. Not when you can use CASCO NT-565 for bonding foil for everything from heat-resistant insulation to water-resistant labels.

This CASCO NT-565 can help you save in many ways. The cost of adhesion is low due to high operating speed with high coverage—as little as ½ to 1 lb. per 3000 sq. ft. may be used with excellent results. Expensive down time is avoided since change-over time from one single-purpose adhesive to another is eliminated. And by ordering this one versatile adhesive from one source, you save on shipping costs.

Most important—you can rely on the uniform high quality of CASCO NT-565 to provide an excellent fibre-tearing bond for almost all types of paper or board. And its mechanical stability and machining properties are outstanding.

If you're not already using CASCO NT-565, why not contact Borden today for a lab sample or a trial run? The Borden Chemical Company, a division of The Borden Company, Dept. PT-38, 350 Madison Ave., New York 17, N. Y.

Heat-resistant CASCO NT-565 provides durable bond for insulation and cooking-tray foil. No delaminations when heat-sealed.

Water-resistant bonding for beer labels, frozen food packages, and building paper is assured with Borden's CASCO NT-565.

Oil and grease-resistant properties of CASCO NT-565 are ideal for paper foil used in contact with fats and oils.

Emboss in sharp detail without danger of unsightly blisters or delamination with versatile CASCO NT-565.

IF IT'S A

Borden ©T.B.C. *Chemical*

IT'S GOT TO BE GOOD!

FOIL-LAMINATING GLUE • LABEL GLUE • CASE-SEALING GLUE

PRICES OF FIBERS

MARKET WOOD PULP

FIRST QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

Delivered Basis

	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$82.50/ 90.00	$82.50/ 90.00	§$90.00/ —	§$90.00/ —	§$90.00/ —
Bleached Gw'd. ...	$97.50/100.00	$97.50/100.00			
Kraft, Blchd.	157.00/ —	160.00/162.50	§157.00/162.50*		§157.50/ —
Kraft, Blchd. Hdwd.	152.00/ —		§137.00/ —		
Kraft, Semi-bleached	140.00/ —	140.00/ —			
Kraft, Unbl.	117.50/125.00	125.00/130.00	†125.00/130.00	125.00/ —	
Sulphite, Blchd. ...	155.00/ —	155.00/ —	*155.00/ —	*155.00/ —	155.00/ —
Sulphite Bl. Hdwd.	150.00/ —				
Sulphite, Unblchd. .	135.00/ —	135.00/ —	†135.00/ —	*130.00/ —	
Sulphite, Unb'l. Gl'sn		134.00/ —	†134.00/ —		
Soda, Blchd.	147.00/150.00	150.00/ —			

§ On Dock Atlantic Ports. * Freight allowed. † Varying Freight Allowances

NEW YORK RAG MARKET

PRICES NOMINAL

New Domestic Cotton Cuttings

Delivered Mill Basis

	Per 100 lbs.
No. 1 White Shirts	$13.50/$15.50
No. 1 Unblchd. Muslins	16.50/ 17.50
Blchd. & Unblchd. Underwears ...	15.50/ 16.50
No. 1 Light Silesias	6.75/ 7.25
No. 1 Light Blue Overalls	7.00/ 7.50
Percales	6.00/ 6.50
No. 1 Light Prints	5.00/ 5.25
Suntan Khakis	6.00/ 7.00
Cottonades	3.00/ 3.50
No. 1 Washables	2.50/ 3.25

Old Domestic Cotton Rags

Delivered Mill Basis

	Per 100 lbs.
Mixed White	$3.25/$3.75
Cotton Pants & Overalls	2.25/ 2.75
Twos and Blues, Repacked	2.00/ 2.50
No. 2 Roofing	.60/ .75

COTTON LINTERS

Memphis Market

f.o.b. Oilmills

Week Ended March 13		For 100 lbs.
Grade 1	n. a.	
2		
3		$9.75/ $8.50
4		8.00/ 7.50
5	1 cut—felting	7.00/ 6.00
6		5.50/ 5.00
7		5.00/ 4.50

*Based on 73% cellulose.

Old Rope & Bagging

(Prices to Dealers, f.o.b. N.Y.)

	Per 100 lbs.
New Burlap Cuts	$4.50/$5.50
Scrap Burlap	3.50/ 4.25
Australian Wool Pouches	5.00/ 5.50
Gunny	4.50/ 5.00
No. 1 Domestic Manila Rope	6.25/ 7.50
No. 1 Foreign Manila Rope	5.25/ 6.25
Domestic Sisal Strings	4.00/ 4.50

WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	March 17	March 17	March 17	March 17
No. 1 Mixed Paper	$5.00/ $8.00	5.00/ 7.00	4.00/ —	12.00/ —
No. 1 News	13.00/ 15.00	14.00/ —	16.00/ —	12.00/ —
Overissue News (Lg. size)	16.00/ 18.00	11.00/ 14.00	21.00/ —	16.00/ —
Mill Wrappers	11.00/ 13.00	12.00/ 14.00	7.00/ —	13.00/ —
Old Corrugated Containers	21.00/ 22.00	20.50/ 21.00	19.00/ —	20.00/ —
Super Resorted Kraft Paper ...	30.00/ 35.00	35.00/ 45.00	35.00/ —	45.00/ —
New Double Kr. Ld. Corr. Cuts	25.00/ 30.00	30.00/ 32.50	32.50/ —	30.00/ —
(Semi-chem. medium)	40.00/ 45.00	37.50/ 45.00	40.00/ 45.00	35.00/ 45.00
New 100% Kraft Corr. Cuts ...	50.00/ 55.00	50.00/ 55.00	55.00/ —	45.00/ —
New Br. Kraft, Env. Cuts	65.00/ 70.00	70.00/ 75.00	55.00/ —	50.00/ 55.00
New Br. Kr. Bag Waste Prntd.	55.00/ 60.00	55.00/ 60.00	50.00/ —	45.00/ 50.00
New Br. Kr. Bag Waste Unprintd	60.00/ 65.00	65.00/ 75.00	55.00/ —	45.00/ 50.00
No. 1 Groundwood Shvs.	23.00/ 27.00	24.00/ 30.00	16.00/ —	25.00/ 30.00
White Newsblanks	50.00/ 55.00	45.00/ 53.00	35.00/ —	55.00/ —
No. 1 Soft White Shvs.	55.00/ 60.00	60.00/ 65.00	55.00/ —	— / —
Super Soft White Shvs.	65.00/ 75.00	75.00/ 85.00	65.00/ —	— / —
Hd. White Shvs.	90.00/ 95.00	100.00/110.00	90.00/ —	85.00/ 90.00
Hd. White Env. Cuts	115.00/125.00	120.00/130.00	100.00/ —	100.00/110.00
Col. Tab. Cards	50.00/ 60.00	55.00/ 60.00	47.50/ —	37.50/ —
Manila Tab. Cards	60.00/ 70.00	70.00/ 75.00	65.00/ —	75.00/ —
No. 1 Col. Ledger	28.00/ 30.00	30.00/ 35.00	40.00/ —	20.00/ —
White Ledger	42.50/ 50.00	45.00/ 50.00	52.50/ —	35.00/ —
Mixed Book & Mag.†	15.00/ 18.00	17.00/ 19.00	12.00/ —	— / —
No. 1 Books‡	25.00/ 27.00	22.00/ 24.00	27.50/ —	— / —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% of groundwood.

PRICES OF MATERIALS

Aluminum sulphate:			
coml. bulk, c.l. wks.	cwt.	$2.00	/ —
iron-free, c.l. wks.	cwt.	3.55	/ —
Casein, acid prec.:			
dom. sh. pt. c.l. (30 mesh)	cwt.	56.00	/
Arg. ex. dock	cwt.	20.00	/21.00
New Zealand	cwt.	24.00	/25.00
Caustic soda:			
c.l. wks. solid, 76%	cwt.	4.30	/ —
flak. & grd. drums, c.l.	cwt.	4.70	/ —
liquid 50% tanks		2.90	/ —
liquid 73% tanks		3.00	/ —
China Clay			
dom., dry-grd., airfloat:			
325 mesh bgs., c.l. Geo.	ton	10.00	/12.00
300 mesh, bgs., c.l. Geo.	ton	13.50	/14.50
imp., white, lump, c.l. ex. dock		20.00	/35.00
Chlorine:			
single-unit tanks, works	cwt.	3.15	/ —
multiple unit, 2-5 cars per yr.		5.25	/ 4.05
Lime:			
hydrated, bulk, c.l. N.Y.	ton	24.45	/ —
quicklime, bulk, c.l. N.Y.	ton	21.20	/ —
Gum rosin:			
K, M, N, drums, c.l. Savan.	cwt.	7.75	/ 7.85
Rosin size:			
70%, gum & pale paste, tank cars, south, sh. pt.	cwt.	7.38	/ 7.48
Saltcake:			
dom. bulk, 100% anh. wks.	ton	28.00	/ —
Soda ash:			
light, 58% ash bags, wks.	cwt.	1.85	/ —
bulk, c.l. wks.	cwt.	1.55	/ —
Sodium chlorate:			
drums, c.l., wks.	cwt.	9.00	/ —
drums, l.c.l., wks.	cwt.	9.50	/10.50
Sodium peroxide:			
dms., c.l. E. of Miss.	lb.	.20½	/ —
l.c.l. (same basis)		.21	/ .21½
Sodium silicate, 40° Be.:			
tank-cars, wks.	cwt.	1.20	/ —
drums, c.l. wks.	cwt.	1.55	/ —
47° Be. WW.			
tank-cars, c.l. wks.	cwt.	1.90	/ —
drums, c.l. wks.	cwt.	2.25	/ —
Soybean, protein:			
chem. isol., wks. c.l. bags	lb.	.23	/ —
Starches:			
Corn, multiwalls, c.l. prod. plant:			
pearl	cwt.	6.49	/ 6.75
white, dextrins	cwt.	8.08	/ 8.20
chlorinated	cwt.	8.25	/ 8.35
potato, Idaho, c.l. wks.	cwt.	6.35	/ —
East, fr. all. 50 cents cwt.			
potato, Maine, f.o.b. wks.	cwt.	6.25	/ —
Sulphuric acid:			
60° Be. cbys. c.l. wks.	cwt.	2.00	/ —
l.c.l. wks.	cwt.	2.45	/ —
tank-cars, wks.	ton	18.60	/ —
Sulphur:			
crude, c.l. mines, contract,	long ton	23.50	/ —
f.o.b. vessels Gulf dock	ton	25.00	/ —
Sulphur dioxide:			
liquid, coml. cyl., wks.	lb.	.10	/ .12
multi-unit cars, wks.	lb.	.0535	/ —
Talc, fibrous grd., bags:			
c.l. wks., N.Y.	ton	28.00	/ —
l.c.l. wks., N.Y.	ton	31.00	/36.00
Titanium dioxide:			
anstase, c.l. dlvd. E. bags	lb.	.25½	/ —
l.c.l. dlvd.	lb.	.26½	/ —
rutile, c.l. dlvd.	lb.	.27½	/ —
l.c.l. dlvd.	lb.	.28½	/ —

Groundwood Bleaching

Dr. K. H. Klemm
Manager, München Dachauer Papier Fabriken
Munich, Germany

English text by
G. P. Chinn

Because of the high yields obtained from the grinding operation compared with the other pulping processes and the relatively low production costs, groundwood is the preferred raw material for the production of lower grade printing papers (i.e. newsprint, rotogravure and machine coated papers, etc.) The use in higher quality papers was restricted by a relatively low brightness and the tendency to age rapidly. A considerable broadening of the range of papers in which groundwood could be used was possible only with the introduction of modern bleaching processes which were able to raise the brightness to the level of bleached chemical pulps. The first effort to use groundwood for higher grade papers was to balance the low brightness groundwood with bleached chemical pulps. However, experience proved that the detrimental influence of its low brightness was far greater than the beneficial influence of the bleached sulphite on the final brightness of the paper. In such mixtures, the brightness of the finished paper can be increased by one point G.E. either by increasing the groundwood brightness by three, or the chemical pulp brightness by six points G.E. (1). This example demonstrates the importance of groundwood bleaching.

Theory of Groundwood Bleaching

Groundwood, as already shown, is a very complex substance not only with regard to its physical constitution and the ratios of the various structural sizes to each other but also with regard to the micro-structure and chemical composition. It must be realized, with regard to groundwood bleaching, that during grinding, additional mechanical changes in the fiber particles occur which cannot be controlled within close limits. Whether, or to what extent, a chemical change also results from the grinding action has not been definitely established to date. Because of the above, and the lack of knowledge regarding the reactions involved, groundwood bleaching has been developed more on an empirical than a scientific basis. Most probably, the low brightness of groundwood is related to the lignin component of the wood (2). However, the traces of numerous organic coloring compounds, which differ with the various wood species, certainly must not be overlooked. It may be these different types of coloring compounds which account for the difficulties encountered when bleaching groundwood made from certain wood species. Generally, the following factors influence the brightness of groundwood:

1—The natural color of the wood.

2—The change in the wood as effected by sunlight.

3—The deterioration of wood by micro-organisms.

4—The discoloring of wood by high temperatures.*

The chemicals used for bleaching groundwood can be divided into oxidizing and reducing agents. Sodium bisulphite ($NaHSO_3$) and sodium hydrosulphite ($Na_2S_2O_4$) are reducing agents which are effective in acid solutions. Their brightening action is most probably related to an addition of their dissociation products to the coloring materials in the wood or by a change of these materials. This is not a true bleaching effect (as would be the elimination of the coloring substances). The compound only undergoes a temporary change from a form which has color to one which is colorless. This change is reversible and the original color may be restored by the action of the oxygen in the air, heat or light.

The oxidizing type bleaching agents (such as hydrogen peroxide [H_2O_2], sodium peroxide [Na_2O_2], and hypochlorite [HClo]) need alkaline conditions to become effective. The theory that peroxide is dissociated during bleaching into water and oxygen and that the oxygen is the actual bleaching agent has been replaced by the concept that the bleaching effect is related to the dissociation of peroxide into ions, with the HO_2—ion being the true bleaching agent. It is believed that this ion selectively oxidizes and/or hydrolyses the organic coloring compounds in the wood and does not affect the lignin and cellulose. While this bleaching effect is partially reversible, the brightness increase is more stable than when obtained with reducing agents. As dissociation of peroxide into HO_2^- ions becomes preferred at a pH above 10, the high pH required with peroxide bleaching can be explained. High pH is also necessary in hypochlorite bleaching but in this case, it is to prevent chlorination and dissolving of the lignin. In both cases, as a high pH decreases the pulp brightness, it is necessary to balance the detrimental effect of the alkali with a comparatively large quantity of bleaching agent.

Bisulphite Bleaching

Bleaching with bisulphite (4) has been known since about 1877 and is the oldest bleaching method used in groundwood mills. The process involves a very slow reducing bleach which effects a temporary change in the organic color compounds in the groundwood. Usually, one to two per cent bleaching agent related to oven dry groundwood is added as a 10 per cent solution. Because of the considerable reaction time required (12-24 hours), the bisulphite bleaching process is not used in a mill where the pulp passes directly from production to the paper machine. The bleaching solution is generally added to the pulp at the wet lap machine by using a lead drip pipe and a felt or manchon covered distribution roll. The brightening effect then takes place during the time the pulp is in transportation or storage. Bisulphite bleaching is also carried out on groundwood being stored in large storage tanks. In this case, the bleaching solution is usually added at the couch rolls of the thickeners or after the screw presses.

* The influence of heat can be observed during wood grinding. If the temperature in the grinding zone becomes very high, the resulting pulp develops a brownish color which is very easily distinguishable.

The bleaching effect of bisulphite is comparatively low. Generally, a brightness increase of two to three points G.E. can be expected with the addition of one per cent, and three to four points G.E. with the addition of two per cent, of the bleaching agent based on the oven dry weight of the groundwood. (These and all subsequent brightness increase data are related to spruce wood. With other species, deviations from these figures must be expected.) Neither temperature nor consistency have a marked influence on the bleaching action. Bisulphite solutions are, however, decomposed by oxidizing agents and, light, heat and therefore, should be prepared in relatively small batches sufficient for up to eight hours production.

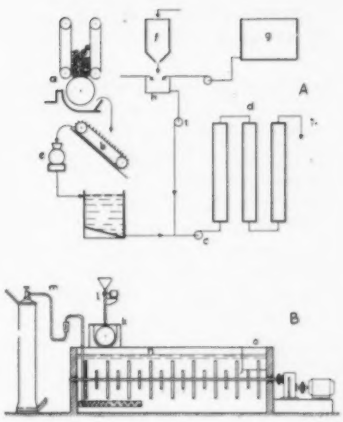


FIGURE 1—LAYOUT FOR HYDROSULPHITE BLEACHING

A—Tower bleaching;

B—Chest bleaching with zinc powder and SO_2 gas.

a—Grinder; b—Scraper type coarse screen; c—Stock pump; d—Bleaching tower; e—Hammermill; f—Proportioning tank for sodium hydrosulphite; g—Storage tank for tripolyphosphate and caustic soda solution; h—Mixing tank; i—Bleaching solution pump; k—Stock feed from the thickeners (by worm conveyor); l—Zinc powder feeder; m—Controlled addition of SO_2 gas; n—Mixing chest; o—Stock overflow to further processing.

Hydrosulphite Bleaching

Groundwood bleaching with hydrosulphite was first introduced in North America about 25 years ago. Sodium or zinc hydrosulphite, or zinc powder with sulphur dioxide gas can be used. As with bisulphite bleaching, with an increasing ratio of bleaching agent to oven dry pulp, the brightness gain increases to a maximum which cannot be exceeded. This process is, therefore, suitable where only a limited brightness increase is desired. While both sodium and zinc hydrosulphite in powder form give approximately the same brightening effect, when zinc hydrosulphite is used, the stability of the brightness increase seems to be somewhat higher and the pulp is more resistant to micro-organism attack. As both chemicals decompose readily in air and at high temperatures, much attention must be given to the elimination of air during the bleaching process.

Also with hydrosulphite, the bleaching effect is a decoloring of the organic coloring compounds in the wood. It is believed that the hydrosulphite, with the addition of oxygen and water in the bleaching process, breaks down into acid, sulphate and sulphite compounds. These combine with the organic coloring substances present in the wood and form colorless compounds. In contrast to the bisulphite process, the bleaching effect occurs very rapidly and at a rate very dependent upon the temperature, consistency and pH. The reaction requires one hour at 86°F. and only 15 minutes at 150-165°F. As a thorough mixing of the bleach solution with the groundwood is essential, consistencies in the range of one to six per cent have proven best in practice. At higher consistencies, because of insufficient mixing, a lower brightness gain can be expected. With regard to the pH, optimum results are obtained when this is between 5.0 and 6.5. Above 6.5, the groundwood takes on a yellow color while below a pH of 4.5, the bleaching agent decomposes. The economic quantity to be used is in the range of 0.5-1.0 per cent on oven dry pulp. Above one per cent, the bleaching effect increases only very slowly. In some mills, the addition of 0.5 per cent tripolyphosphate to the bleach solution increased the final brightness by one to two points G.E. Caustic soda is added to control the pH. Under optimum conditions and at temperatures between 150-165°F. the addition of 0.5 per cent of either zinc or sodium hydrosulphite should give a brightness increase of 6-8 points G.E., and with 1.0 per cent bleaching agent, 8-10 points G.E.

The original practice was to add the hydrosulphite to the pulp in the beaters or storage chests. However, the modern trends show preference for bleaching towers. These are economical because the rapid bleaching action allows relatively small towers to be used. If these towers receive the pulp immediately from the grinder pits, the high temperature of the pulp at that point is most favorable for the bleaching reaction. Figure 1 A shows such an installation. The coarsest slivers are removed from the pulp coming from the grinder pits at **(a)** by a scraper type coarse screen **(b)**. The groundwood is then fed directly by the stock pump **(c)** to the bleaching towers **(d)**. The splinters removed by the coarse screens pass through the shredder **(e)** and are then recirculated to the inlet of the scraper screens. With this arrangement, not so much care is necessary to recover all good fibers from the coarse screen rejects and the shower water used can be kept low. The groundwood fed to the towers has a consistency of 1.5-3.0 per cent and a temperature of about 170°F. The bleaching solution is prepared by feeding the sodium hydrosulphite powder **(f)** into a five per cent solution of tripolyphosphate and caustic soda in the mixing tank **(g)**. The bleaching solution is then added into the suction side of the stock pump. At the temperature prevailing, a retention time of 15 minutes in the tower is sufficient. The bleached groundwood leaving the towers is screened and thickened in the usual manner without further treatment. With buffered bleach solutions of

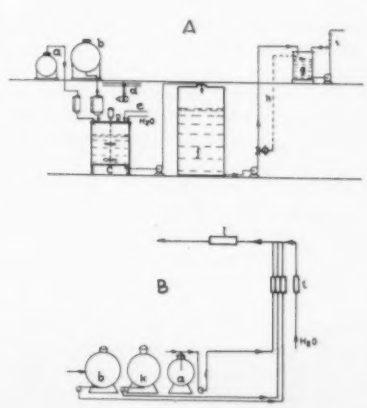


FIGURE 2—PREPARATION OF ALKALINE PEROXIDE BLEACHING SOLUTION

A—Batch system

B—Continuous system

a—Storage tank for H_2O_2. b—Storage tank for sodium silicate; c—Alkaline bleach preparation tank; d—Weighing of sodium peroxide; e—Weighing of magnesium sulphate; f—Alkaline bleach storage tank; g—Tank for measured quantity of bleach solution to be added to pulp; h—Float type constant level regulator; i—Rotameter; k—Storage tank for sodium hydroxide; l—Mixing chamber.

TABLE I—COMPOSITION OF PEROXIDE BLEACHING SOLUTIONS

	Percentage by weight		
Magnesium sulphate	0.05%	0.05%	0.05%
Sodium silicate	0.50	0.50	0.50
Sodium peroxide	...	2.00	1.00
Sulphuric acid	...	1.40	...
Hydrogen Peroxide	1.68	...	0.84
Sodium hydroxide	1.00	...	...

this type, no corrosion difficulties have been observed in the paper mill although they can occur in the more closed system in the groundwood mill. The towers themselves must be corrosion resistant and are built of stainless steel or Lithcoted pipes. Cast iron, rolled steel and phospher bronze are readily attacked by hydrosulphite while stainless steel and brass are resistant.

The use of zinc powder and sulphur dioxide gas was recommended first by Danninger (5) to whom a German patent was granted for the application of zinc hydrosulphite in "nascent state." The main advantage of this over the sodium hydrosulphite process is that both chemicals are stable during storage and there are, therefore, no decomposition losses of the bleaching agents. In practical operation, the process is usually carried out as shown in Figure 1 B. The groundwood coming from the thickeners is mixed with a controlled amount of zinc powder **(i)** which ranges from 0.1-0.2 per cent related to oven dry pulp. Sulphur dioxide gas is added in the mixing tank **(k)** and/or partially, directly into the thickened stock chest or at the beaters. Recent installations show a preference for bleaching in towers using sodium or zinc hydrosulphite in power form.

Peroxide Bleaching

Although as early as 1905 and 1907, German and United States patents, respectively, were granted for bleaching groundwood with peroxide, the practical introduction of the peroxide bleaching process did not take place until about 1941. Since then, there has been a very rapid development which is still continuing.

Peroxide is an oxidizing agent which acts by oxidation and/or hydrolysis upon the coloring compounds in the wood on which it has a decolorizing effect. This process requires the following steps:

1—The preparation of the peroxide solution.

2—The mixing of controlled quantities of the peroxide solution with the groundwood.

3—Provision of sufficient storage space to allow the required reaction time.

4—Reducing the residual peroxide and adjusting the pH to that required for paper manufacture.

The following chemicals are used: hydrogen peroxide and/or sodium peroxide, sodium silicate, sulphuric acid or caustic soda, magnesium sulphate and a reducing agent such as sulphur dioxide, sodium hydrosulphite, sodium bisulphite or calcium bisulphite. Depending upon the peroxide used, different chemicals are required for pH adjustment (H_2SO_4 with Na_2O_2 and NaOH with H_2O_2). If, however, both peroxides are used in the correct ratio, neither of the other chemicals are necessary. The bleaching agent is the hydrogen and/or sodium peroxide.

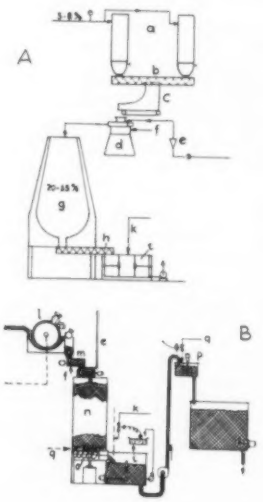


FIGURE 3 — ARRANGEMENT FOR THE PEROXIDE BLEACHING OF GROUNDWOOD

A—Tower bleaching of high consistency pulp

B—Tower bleaching of medium consistency pulp

a—Screw press; b—Screw conveyor; c—Proportioning apparatus for pulp; d—Mixer; e—Proportioning apparatus for bleach solution; f—Steam inlet for raising pulp temperature; g — High consistency bleaching tower; h—Screw conveyor for discharging from tower; i—Neutralization chest; k—Controlled addition of reducing agent; l—Vacuum filter; m—Proportioning and mixing installation; n — Medium consistency bleach tower; o—Discharge from tower; p—Consistency regulator; q—Dilution water addition.

TABLE II—EFFECT OF CONSISTENCY ON PEROXIDE BLEACHING ECONOMY

Consistency during the Bleaching Process	Percentage of costs as compared with the same brightness gain at 5% consistency
5	100
10	81
15	70
20	65
25	63
30	61
35	59.5

Sodium silicate aids the stability of the bleach solution by acting as a buffer for pH control, preventing corrosion and "de-activating" roughened surfaces. The very strong catalytic effect of trace metallic ions (especially iron, copper and manganese) on the decomposition rate of peroxide is inhibited by the magnesium sulphate. As the literature relating to peroxide bleaching has grown enormously during recent years, the limited scope of this discussion permits only a few of the papers to be mentioned (7).

Bleaching solution preparation can be done in either a batch or a continuous system. In each case, the sequence: water, magnesium sulphate, sodium silicate and peroxide must be observed. Conventional compositions of the bleaching solution are given in Table I.

As sodium silicate can easily plug its feed line, hoses are recommended as the hardened silicate layer can be loosened by flexing the hose. Figures 2 A and 2 B show the principle of continuous **(A)** and discontinuous **(B)** preparation system for peroxide bleaching liquor. In **(A)**, two tanks are provided for the storage of hydrogen peroxide **(a)** and sodium silicate **(b)**. These reagents enter the mixing tank **(c)** through two measuring tanks. Sodium peroxide **(d)** and magnesium sulphate **(e)** are added by weight. The bleaching liquor is pumped in batches to the storage tank **(f)** and enters the bleach plant through a smaller tank **(g)** fitted with a constant level controller **(h)**. From here, the bleaching liquor is fed continuously at a rate controlled by rotameter **(i)** to the mixer. When hydrogen peroxide is used, the continuous system is very simple as the sodium silicate **(k)**, sodium hydroxide **(l)** and hydrogen peroxide **(m)** can all be pumped from storage tanks at rates controlled by rotameters **(n)** into the mixing chamber **(o)**.

The economics of peroxide bleaching are greatly influenced by the pulp consistencies used. Bleaching costs decrease rapidly with increasing consistency as shown in Table II. As a result, in recent years much attention

has been given to bleaching at high (10-15 per cent) and extremely high (above 20 per cent) consistency. In Figure 3 A, the principles of an installation for high consistency bleaching is shown. The groundwood leaving the thickeners at five to eight per cent consistency is further thickened by the screw press **(a)** and from here, fed by the screw conveyor **(b)** to the metering device **(c)**. The bleaching liquor **(e)** is added uniformly to the groundwood by the mixer **(d)** and steam **(f)** is used to obtain the desired temperature. The treated groundwood is then fed to the bleaching tower **(g)** which is constructed to handle consistencies in the range of 20-35 per cent. After the necessary time interval, the pulp is discharged by the screw conveyor **(h)** into the tank **(i)** where automatic pH control **(k)** is provided.

Figure 3 B illustrates a medium consistency bleaching system. The groundwood leaves the vacuum filters **(l)** and is fed through a measuring and mixing device **(m)** to the bleaching tower **(n)**. The screw conveyor **(o)** discharges the bleached groundwood into the pH controlled **(k)** neutralization tank **(i)** from which it is pumped at a regulated consistency **(p)** to the paper mill. The points **(q)** and **(f)** are for water and steam addition, respectively. Sulphur dioxide is usually added to neutralize the residual peroxide and bring the pH down to the range of 7. If a further pH decrease is required, it is advantageous to achieve this with alum.

In addition to the pulp consistency, variables which influence the bleaching effect are: temperature, alkalinity, pH and percentage of bleaching agent related to oven dry pulp. The main effect of the temperature is on the required bleaching time which decreases as the temperature increases. In contrast to the reducing type bleaches, with peroxide the brightness gain does not level off but continues to increase as the amount of bleaching agent used is increased. However, as higher brightnesses are reached, more and more peroxide is required to raise it by one point G.E. The amount of bleaching agent used, therefore, usually is dependent on economic considerations such as the grade of paper being manufactured. The optimum alkalinity of the bleaching liquor differs from mill to mill and must be established by laboratory trials. The normal range is 1.2-1.9 per cent sodium hydroxide related to oven dried groundwood. Usually the alkalinity must be decreased as the temperature and consistency is decreased. With regard to pH, best results can be expected if it is held between 10.0 and 10.5 throughout the process. Under favorable conditions, with 1.0 per cent peroxide, a brightness increase of 6-7 points G.E., and with 2.0 per cent, 10-12 points G.E. should result.

Hypochlorite Bleaching

The development of the hypochlorite bleaching process began in 1921 when Schmidt and Graumann found that cellulose and other carbohydrates, under alkaline conditions, are not attacked by chlorine dioxide. This process has been developed for raising the brightness of groundwood only during the past few years and is suited, especially, for groundwood from hardwoods. As with peroxide, the bleaching effect is related to the strong oxidizing power of alkaline hypochlorite solutions.

While practical experience with a hypochlorite type groundwood bleach is not yet available, Yankowski (1) gives the following description. The thickened groundwood at five to six per cent consistency and about 100°F. is fed into a small reaction tank holding 1.0-1.5 tons (o.d.). Part of the alkali required is added with the bleaching liquor and the remainder during the bleaching process to maintain the pH in the range of 9-11. After the hypochlorite is completely used up (20-25 minutes) the bleached groundwood is transferred to a second tank where it is washed and neutralized, as with the peroxide process, to a pH of 5.0-5.5. The speed of the reaction and the

TABLE III—A COMPARISON OF THE DIFFERENT BLEACHING PROCESSES FOR GROUNDWOOD
(according to A. A. Yankowski)

PROCESS	BISULPHITE	HYDROSULPHITE	PEROXIDE	HYPOCHLORITE
Bleaching chemicals	Sodium bisulphite	Zinc hydrosulphite Sodium hydrosulphite Sulphur dioxide Zinc powder	Sodium peroxide Hydrogen peroxide Sodium silicate Sodium hydroxide Sulphuric acid Magnesium sulphate	Calcium hypochlorite Sodium hypochlorite
Normal addition in per cent on (o.d) groundwood	1 - 2	0.5 - 1.0	1.5 - 3.0	up to 15
Other chemicals and their effect		Sodium tripolyphosphate (Gain 1-2 points G.E.)	Calcium chlorite (Gain 1-2 points G.E.)	
Effect of consistency	Very small	Between 1-6%, none Above 6%, decrease of bleaching effect	With increasing consistency, increasing reaction speed and brightness gain	Optimum, 4-6%. Above 6% difficulties with process control
Effect of temperature and temperature range	Very small	90-160°F; with increasing temperature, increasing reaction speed and brightness gain	90-160°F; with increasing temperature, increasing reaction speed	100°F; danger of destructive attack on fibers, above 100°F
pH range and influence of pH	below 7; very small	5-6.5; above 6.5, decrease of brightness; below 4.5, decomposition of bleaching agent	10-10.5; above and below this range, decrease of brightness	9-11; below and above this range, increasing chlorine consumption
Further treatment	none	none	acidification with SO_2 or other reducing agents	acidification with SO_2 and washing
Normal brightness increase in points G.E. (spruce wood)	1.0%; 2-3 points 2.0% 3-4 points	0.5%, 6-8 points 1.0%, 8-10 points	1.0%, 6 - 7 points 2.0%, 10-12 points	15% chlorine, 10 points; (10% chlorine, 12 points with hardwood pulps)
Chemical costs per ton (o.d.) pulp (1955)	1.0%, $0.90 2.0%, $1.80	1.0%, $4.30	2.0%, $10.65	10%, $11.82 (hardwoods)
Chemical costs per point brightness increase/ton (o.d.) pulp	1.0%, $0.35 2.0%, $0.50	1.0%, $0.30 to $0.60	2.0%, $0.70 to $1.00	10%, $0.80 to $1.00 (hardwoods)

Van-Cor

90 and H Joining Strips

Revolutionary Method of Connecting PVC Sheet Stock—Van-Cor 90 and H joining strips use solvent welding to obtain maximum joint efficiency. They save time and money compared with hot air welding. Skilled welders are unnecessary—your own men can fabricate readily. On major installations using these Van-Cor strips, job costs have been cut over 30%!

Two Shapes—Three Sizes—Use 90 degree joining strips for making corners, H strips in a single plane. They handle sheet in ⅛", 3/16" and ¼" gauges. Both shapes available in Van-Cor 1 (normal impact) and Van-Cor 2 (high impact). Standard strip length is 10 feet.

For flanges and stiffeners of fabricated sections, extruded structural angles in 10 foot lengths are available in sizes 1½" x 1½" x 3/16" and 2" x 2" x ¼".

Write for Complete Data

INDUSTRIAL DIVISION OF...

COLONIAL PLASTICS MFG. CO.

Subsidiary of THE VAN DORN IRON WORKS CO.

2685 EAST 79TH STREET CLEVELAND 4, OHIO

bleaching effect increase rapidly with increasing temperature but the control of the process becomes more and more difficult. It is recommended, therefore, that the temperature of about 100°F. is not exceeded. While consistency does not appear to influence the bleaching effect, higher consistencies do increase the reaction speed and control of the process again becomes difficult. Buffering compounds must be added to prevent a destructive attack on the wood fibers. At a ten per cent chlorine consumption, a brightness increase of about 12 points G.E. can be expected for hardwood pulps. The same brightness increase for softwood pulps requires about 15 per cent chlorine.

Comparison of Processes

Brecht, Jayme and Schuster (9) made a critical comparison of the different bleaching processes and Yankowski (1) compiled the most important data into a table. Peroxide bleaching is superior to the two older (bisulphite and hydrosulphite) processes used. With an equivalent amount of bleaching agent, peroxide will raise the brightness of groundwood pulps to the level obtained with bleached chemical pulps. However, this superiority of the peroxide bleaching process is balanced by high costs (see Table III) and, therefore, the cheaper hydrosulphite process will continue to be employed, especially as the use of higher temperatures indicate that improved results may be possible. A further considerable advantage of the hydrosulphite process is the fast reaction rate which permits smaller and, therefore, less expensive bleaching installations. At the present time, sufficient experience with the hypochlorite process is not available to permit it to be included in the following comparisons. Its application with mechanical pulps appears to be limited to groundwood from hardwoods.

Regardless of the bleaching process, discoloring of groundwood during aging or under the influence of light cannot be avoided. In fact, with groundwood of very high brightness, this discoloration occurs faster than with unbleached groundwood. However, after the same aging time, the brightness of the bleached pulp still remains the higher. Pulps treated by the peroxide process maintain their brightness gain for a longer time than when bleached with any of the other processes. When a reducing bleach is used, there is no measurable change in yield or stock properties. With an oxidizing bleach, there is a loss in yield of about one per cent, the dynamic strength properties are lower, the freeness is higher and the sliver content is decreased with

(Continued on page 58)

ZELLSTOFFFABRIK
WALDHOF

Zwei Herren unseres Vorstandes möchten nach über 30-jähriger Tätigkeit in absehbarer Zeit, die zur Einarbeitung eines Nachfolgers ausreicht, aus Altersgründen in den Ruhestand treten. Als Nachfolger suchen wir

eine oder zwei Persönlichkeiten,
(Papiermacher oder Chemiker).

Unsere Gruppe umfasst zwölf Fabrikationsstätten für Zellstoff, Papier, Papierverarbeitung und Wellpappkisten und hat einen Jahresumsatz von etwa 400 Mill.D.M. Sie beschäftigt über 9.000 Menschen. Aus Nadel—und Laubholz werden Sulfitzellstoffe aller Art, insbesondere für die Feinpapier—und Kunstfaserindustrie und Chemische Industrie, hergestellt. Das Papierprogramm umfasst auf 25 Papiermaschinen Cellulosepapiere, ferner feine Schreib—und Druckpapiere und veredelte Papiere, weiter Natronpapiere und Säcke. Ein Teil des Papiers wird für Handtücher, Servietten und hygienische Papiere weiterverarbeitet. Die Sulfitablaugen werden zu Alkohol und Hefe vergoren; ein Teil wird eingedampft und zu Spezialprodukten verarbeitet. In kleinem Umfang werden pharmazeutische Grundstoffe hergestellt.

Die Bewerber sollen diesem umfassenden Produktionsprogramm gewachsen sein. Sie müssen daher über eine nachweislich erfolgreiche Tätigkeit als Leiter grosser Werke verfügen, Führungspersonal mit Erfolg und sozialem Verständnis geleitet haben und Anpassungsfähigkeit für die Zusammenarbeit innerhalb des Führungsgremiums besitzen.

Je nach Erfahrung wird die Leitung des Zellstoffbetriebes einschliesslich des Forschungslaboratoriums und des chemischen Teils oder die Leitung des Papierbetriebes oder die Stellvertretung der technischen Gesamtleitung oder die technische Gesamtleitung sowie bei entsprechender Eignung und nach einzuholender Einwilligung unseres Aufsichtsrates die Stellung eines stellvertretenden oder ordentlichen Vorstandsmitglieds geboten.

Je nach der Art der zu übernehmenden Stellung wird diese dotiert; sie ist mit einer angemessenen Wohnung und Altersversorgung verbunden.

Auch solche Herren, die nur auf dem einen oder anderen Gebiet Erfahrungen haben, kommen für die angebotenen Stellungen in Frage. Es wird gebeten, die Bewerbungen kurz zu fassen. Sie werden auf Wunsch streng vertraulich behandelt und können auch durch Dritte eingereicht werden. Lichtbild, handgeschriebener Lebenslauf und Mitteilung des frühesten Eintrittstermins sind zu richten an:

Dr. Friedrich Dorn
Vorsitzender des Vorstandes der
Zellstofffabrik Waldhof
Wiesbaden, Leberberg 9

SELECT AND ORDER
THE BOOKS YOU WANT!

MODERN PULP AND PAPER MAKING

Revised and enlarged 3rd Edition, edited by John B. Calkin.

Completely describes and discusses all principles and practices involved in modern pulp and paper making. Sturdy cloth binding, 558 pps. $10

TECHNOLOGY OF COATED AND PROCESSED PAPERS

Edited by Robert H. Mosher.

Describes latest developments in the paper converting field, fully illustrated, cloth bound, 736 pps. $15

PULP AND PAPER MANUFACTURE

(Published in 4 Volumes)
J. N. Stephenson, Editor-in-Chief

Volume I: The Preparation and Treatment of Wood Pulp, 377 illustrations, 90 tables, 1043 pages, $10
Volume II: The Preparation of Stock for Paper Making, 194 illustrations, 13 tables, 587 pages, $7.50
Volume III: Manufacture and Testing of Paper and Board, 450 illustrations, 732 pages, $11.
Volume IV: Auxiliary Paper Mill Equipment, 343 illustrations, 36 tables, 732 pages, $9.

Remittance with order.

Lockwood Trade Journal Co., Inc.
49 West 45th Street, New York 36, N. Y.

Yes, send me by post-paid return mail, each book I have checked on this coupon.

☐ MODERN PULP AND PAPER MAKING... $10
☐ TECHNOLOGY OF COATED AND PROCESSED PAPERS $15
☐ PULP AND PAPER MANUFACTURE
☐ Volume I $10.00
☐ Volume II ..... $ 7.50
☐ Volume III $11.00
☐ Volume IV ..... $ 9.00

Name ..... Title .....
Company .....
Address .....
City ..... Zone... State.....

respect to the original pulp. When the bleaching costs are related to the brightness increase achieved with normal quantities of the bleaching agents, those of the peroxide and hypochlorite are nearly double the hydrosulphite processes. When compared on this basis, bisulphite bleaching shows the best results. On the other hand, however, higher brightnesses are possible with peroxide and hypochlorite than with the hydrosulphite and bisulphite processes. The final choice of the bleaching process, therefore, is dependent on the requirements of the paper being produced and its selling price.

Bibliography

(1) Yankowski, A. A. The Bleaching of Groundwood Pulps. *The Paper Industry* 36, no. 10:1006 (1955).

(2) Lewis, H. F. and Buchanan, M. A. Reflections on Groundwood Bleaching. *Pulp and Paper Mag. Canada* 52, no. 4:93 (1951).

(3) Sparrow, D. B. Bleaching Groundwood with Hydrosulphite. *Pulp and Paper Mag. Canada* 56, no. 12:148 (1955).

(4) **Bisulphite Bleaching**

Meltzer, K. The Bleaching of Groundwood Pulp with Special Reference to a New Method. *Papierfabrikant* 35, no. 30/31:297 (1937).

Hirschkind, W. The Bleaching of Groundwood. *Paper Trade Journal* 95, no. 19:31 (1932).

von Holten, G. The Bleaching of Pulp in "Gilg-Silo". *Wochenbl. f. Papierfabr.* 65, no. 31:551 (1934).

(5) **Hydrosulphite Bleaching**

Meltzer, K. (see 4, above)

Andrews, I. H. Zinc Hydrosulphite Treatment of Groundwood. *Pulp and Paper Mag. Canada* 46, no. 9:679 (1945).

Ferguson, R. P. Recent Advances in Zinc Hydrosulphite Bleaching of Groundwood. *Paper Trade Journal* 127, no. 16:52 (1948).

Andrews, I. H. Zinc Hydrosulphite Treatment of Groundwood. *Tappi* 32, no. 6:286 (1949).

Barnes, E. T. A Recent Investigation of the Variables in Zinc Hydrosulphite Bleaching of Groundwood. *Pulp and Paper Mag. Canada* 54, no. 11:145 (1953).

Yankowski, A. A. (see 1, above).

(6) Premo, R. A. Peroxide Bleaching of Groundwood. *Tappi* 35, no. 8:108A (1952).

(7) **Peroxide Bleaching**

Reichert, J. S. Sodium Peroxide Bleaching of Mechanical Pulps—General Description of the Process. *Paper Trade Journal* 118, no. 11:45 (1944); *Pulp and Paper Mag. Canada* 45, no. 6:458 (1944); *Paper Trade Journal* 120, no. 15:143 (1945).

Reichert, J. S., Campbell, D. J. and Secord, R. A. Sodium Peroxide Bleaching of Mechanical Pulps—Effect of Varying the Bleaching Conditions. *Paper Trade Journal* 119, no. 16:49 (1944); *Pulp and Paper Mag. Canada* 45, no. 9:679 (1944).

McEwen, R. L. High Density Bleaching of Mechanical Pulp with Hydrogen Peroxide. *Paper Trade Journal* 122, no. 17:49 (1946).

Ljunggren, B. The Bleaching of Groundwood Pulp with Peroxide—A Literature and Patent Review. *Svensk Pepperstidn.* 50, no. 7:159 and no. 8:196 (1947).

Bowden, H. The Bleaching of Groundwood with Peroxides. *Paper-Maker* (London) 125, Midsummer Number:5 (1953).

Yankowski, A. A (see 1, above).

(8) **Hypochlorite Bleaching**

Casciani, F. Use of Chlorine Dioxide and Chlorates in Pulp and Paper. *Paper Trade Journal* 136, no. 10:21 (1953).

Yankowski, A. A. (see 1, above).

(9) Brecht, W., Jayme, G. and Schuster, G. Mechanical Pulp Bleaching with Peroxide as compared with the Customary Procedures Used Hitherto. *Das Papier* 4, no. 11:174 (1950).

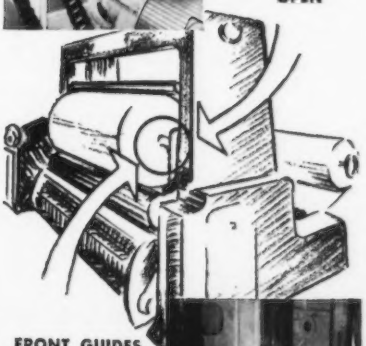
FOAM!
one man's meat . . .
another man's poison!
When it's a problem, ARNOLD, HOFFMAN stands ready with competent service AND the right AHCO DEFOAMER for the job!
AHCO DEFOAMER SAF
AHCO DEFOAMER 69
AHCO DEFOAMER 99
AHCO DEFOAMER 477
AHCO DEFOAMER 97
AHCO DEFOAMER "D" SERIES
AHCO DEFOAMER 116
AHCO DEFOAMER 511
AHCO PRODUCTS
If foam is your problem, discuss it with an AHCO representative.
ARNOLD, HOFFMAN & CO. INCORPORATED
PROVIDENCE, R. I. • EST. 1815
SALES OFFICES
ATLANTA — 3219 Cain's Hill Place
CHARLOTTE — 2130 North Tryon Street
TETERBORO — 370 North Street

JAGENBERG

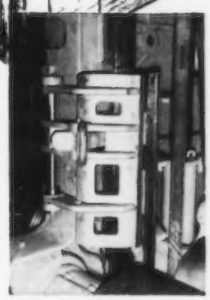
PNEUMATIC REWINDER

Rewind shaft moves precisely between hardened steel panels without any lateral play.

FRONT GUIDES OPEN



FRONT GUIDES CLOSED



Shaft ends are provided with ball bearings.

Some of the other features:

- **Shear or score cut**
- **Rapid knife setting system**
- **Built-in roll lowering device**
- **All rollers are driven**

Priced considerably below any comparable product available.

JAGENBERG
WINDERS
SHEET CUTTERS

Exclusive American Agents:

AMERICAN PAPER & PULP CO., INC.
300 Fourth Avenue, New York 10, N. Y.

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures

(Production as percent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Feb. 8	Feb. 15	Feb. 22	March 1	March 8
1958	87.4	88.4	88.3	89.9r	87.9
	Feb. 9	Feb. 16	Feb. 23	March 2	March 9
1957	96.7	98.0	97.7	96.1	97.6

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1958	85.5‡	88.5‡	—	—	—	—	—	—	—	—	—	—	—
1957	94.2	97.0	97.1	94.0	94.6	93.3	75.6	90.7	86.0	93.0	90.7	81.4‡	90.9

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1951	1952	1953	1954	1955	1956	1957	1958
Year to Date	100.0	97.8	95.2	94.3	94.3	100.4	95.5	86.9
Year Average	98.0	88.6	92.3	91.6	94.0	97.9	90.9	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Assn.

COMPARATIVE WEEKLY SUMMARIES

	Feb. 8	Feb. 15	Feb. 22	March 1	March 8
1958	83	86	89	86	87
	Feb. 9	Feb. 16	Feb. 23	March 2	March 9
1957	94	94	93	92	95

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1958	80	86	—	—	—	—	—	—	—	—	—	—	—
1957	91	94	94	92	93	91	72	94	91	97	92	79	90

† *Percents of operation based on "Inch-Hours" reported on a 6-day basis.*

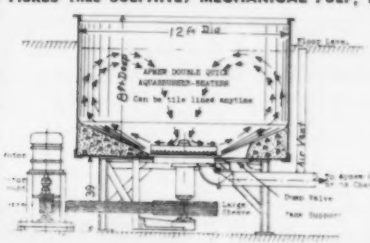
SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	THIS WEEK ENDING Mar. 8, 1958 87%	LAST WEEK ENDING Mar. 1, 1958 86%	CUMULATIVE TO DATE Jan. 1 to Mar. 8, 1958 85%
	Tons	*Tons*	*Tons*
Total Production	265,719	264,351	2,442,115
Liner	85,100	82,196	784,809
Corrugating Material	37,809	41,409	362,919
Chip & Filler Board	5,026	4,143	39,092
Total Container Board	127,935	127,748	1,186,820
Folding	52,400	54,000	488,911
Set-Up	9,073	10,582	93,056
Special Food Board	26,219	25,573	226,461
Other	50,092	46,448	446,867
Total Boxboard	137,784	136,603	1,255,295
Total Orders	*Tons*	*Tons*	
Received	321,182	289,414	
Unfilled End of Week	418,353	362,954	

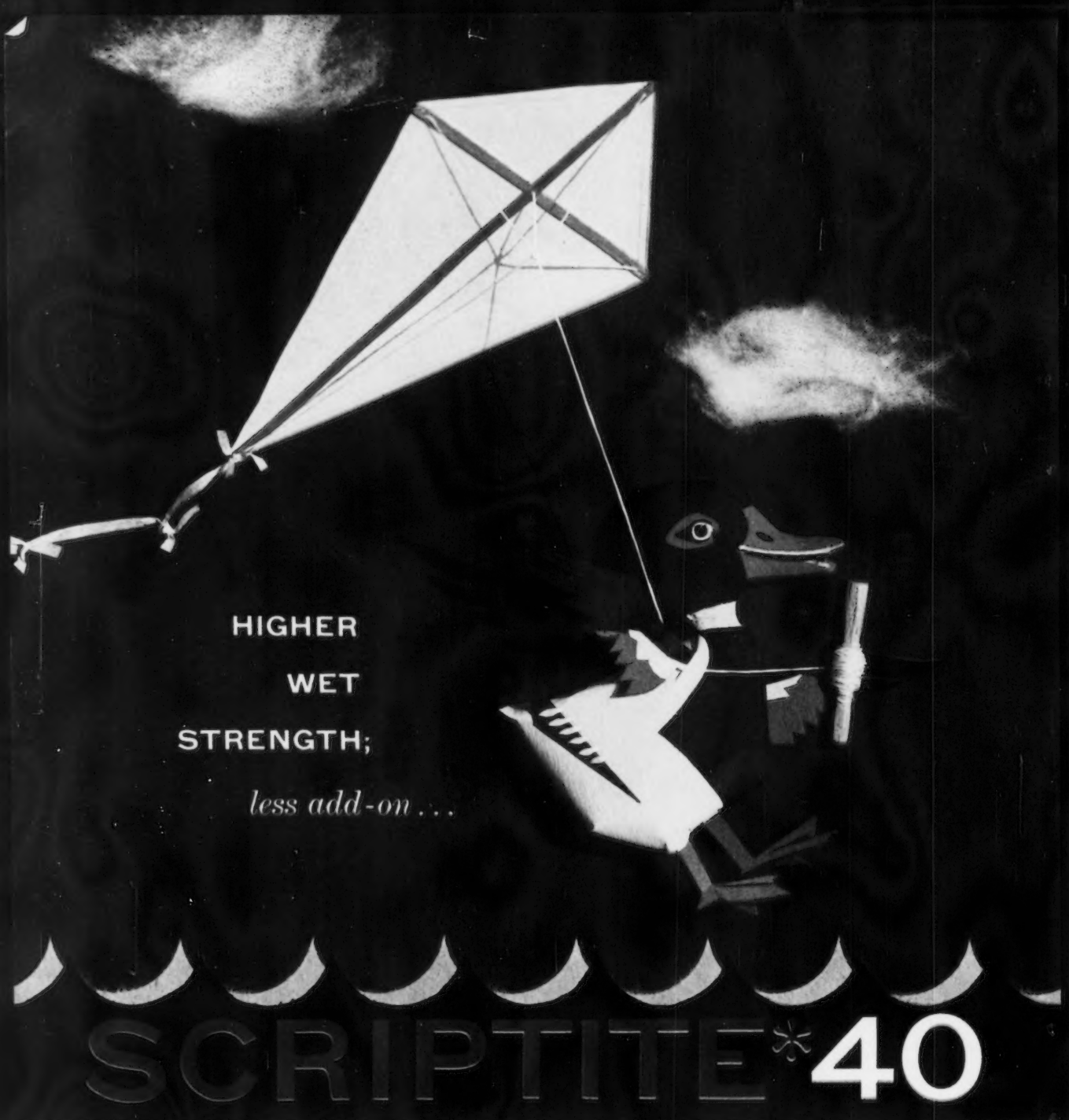
***REPEAT ORDERING*, APMEW UNIVERSAL PAPER PULP MILL for FREE CHINA, that PRODUCES HIGH QUALITY, STRONG LONG FIBRED PULP, like SULPHITE, with *HALF THE USUAL PRODUCTION COSTS*. SO AUTOMATICALLY SIMPLE AND COMPACT THAT IN 100 TONS DAILY CAPACITY, IT CAN BE PLACED ON NEW YORK STATE CANAL BARGE AND BE PORTABLE, CAN BE OPERATED BY SEVEN SCHOOL BOYS A SHIFT, AND CAN BE ERECTED BY 10 MEN IN 15 WEEKS AT *HALF THE USUAL MILL* COST. USES 4% OF THE POWER OF USUAL GROUNDWOOD MILL PRODUCING STRONG LONG FIBRES (like SULPHITE) MECHANICAL PULP, the OTHER 96% POWER IS MADE INTO PROFITABLE HYDRO-ELECTRIC POWER.**

***NEWSPRINT AND BOOK PAPER OF DOUBLE STRENGTH* CAN BE MADE *WITHOUT SULPHITE* FROM APMEW LONGFIBRED MECHANICAL PULP, OR FROM APMEW LONGFIBRED CHEMICAL PULP AT HALF THE PRESENT PULP PRODUCTION COSTS.**

USES THE SAME DEPENDABLE APMEW MACHINES used in 437 APMEW CLEAN STOCK PREPARATION SYSTEMS, used in 128 APMEW DE-INKING SYSTEMS, used in APMEW (GARBAGE & SEWAGE) FERTILIZER COMPOST MILLS. OBSERVE IT. 367 PATENTS. QUICK DELIVERIES.



APMEW, INC., P. O. BOX 1, GLENS FALLS, N. Y.



SCRIPTITE*40

Scriptite 40 is a *new* concept in urea formaldehyde resins for paper finishing. Because this water-soluble resin has been made more cationic, it is strongly attracted to the cellulose, assuring high efficiency in application. Scriptite 40 provides faster cure, and paper products maintain a higher wet strength value with less resin add-on than is usually required. Scriptite 40 also can improve dry tensile, mullen, wet rub resistance, dimensional stability, folding endurance.

For laboratory sample of Scriptite 40 and technical bulletin, write to Monsanto Chemical Company, Plastics Division, Room 348, Springfield 2, Mass.

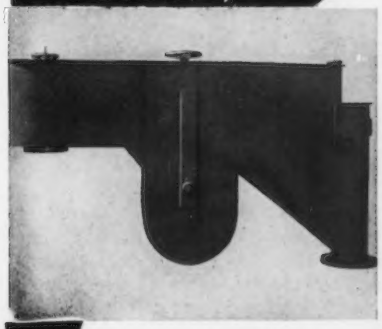
The Monsanto Line of Paper Resins also includes

SCRIPTITE 54 . . . *for outstanding water resistance and both wet and dry rub resistance.*
SCRIPTITE 52 . . . *in combination with formaldehyde to give water resistance to folding boxboard and to jute liner.*
SCRIPTITE 50 . . . *for unsurpassed printability and improved surface characteristics on boxboard.*
SCRIPTITE 33 . . . *a melamine wet-strength resin.*
SCRIPTITE 45 . . . *a new thermosetting resin for the stabilization of paper.*
LYTRON* . . . *water dispersal resin polymers for coatings.*

*SCRIPTITE, LYTRON: REG. U. S. PAT. OFF.

Monsanto

POIRIER
Counterflow



No Moving Parts

GUARANTEED

Consistency—Weight Regulation

Poirier's Automatic Counterflow Regulator is guaranteed to control basis weight and volume regardless of stock consistency.
To you this means better finished paper, quicker, easier and more economically.

Here's Why:—

* Regulates both volume and consistency of up to 900 tons of stock per 24 hours.
* Consistency controlled to within (+—) 1/10 of 1%, basis weight (+—) 2%.
* Volume regulated even when stock is too light to be controlled by consistency.
* Increased yardage by using all stock in chest on each run.
* 4 Separate and distinct controlling actions.
* Only 1 adjustment—can be operated by remote control.

Let our engineers study your operation and furnish you with complete details on how a Poirier Counterflow Regulator will help you as it has others. No cost—no obligation.

Write for full information

POIRIER CONTROL COMPANY
Waterville 1, Maine

Specialists in Stock Control Equipment

NEWS OF SUPPLIERS

A Large Order

Frank W. Egan & Co. is completing shipment of one of the largest single orders for turret unrolls and turret winders in its history. The Somerville, N. J. firm designed and produced the 17 units for a leading converter. Twelve are shown above.

Yale & Towne Manufacturing Co. have named Gerald A. Tamblyn, veteran of 18 years experience in the field of bulk materials handling, sales manager of the new industrial tractor shovel line being introduced by Yale Materials Handling Division.

Pusey and Jones Corp., Wilmington, Del., has appointed E. N. Peterson sales engineer for the Middle West, it was announced by J. W. Kolybaba, Paper Machinery Division sales manager.

Mr. Peterson has been associated with the paper industry since 1930, including 15 years with Beloit Iron Works, four years with Bagley and Sewall. Recently he was with Black-Clawson Co. He will make his headquarters in Milwaukee.

Cleveland Crane & Engineering Co., Wickliffe, Ohio, has broken ground for a new 11,400 sq. ft. research and development building.

The building will include a modernly equipped air-conditioned engineering department and complete shop and testing facilities for assembling, handling and testing equipment under development.

E. Glauner
Pusey & Jones

H. M. Fisher
Biggs Foundry

Pusey and Jones Corp. has appointed Emerson Glauner sales engineer for its paper machinery division. He will specialize in cylinder machine sales with headquarters at the home office in Wilmington.

Biggs Foundry and Fabricating Co. announces that H. M. Fisher has joined its Akron, Ohio plant as vice president in charge of engineering and production.

J. O. Ross Engineering Division Midland-Ross Corp. has completed plans for construction of a new Chicago office building to be located in suburban Mt. Prospect, Ill.

W. C. Naugler
Huyck Felt

L. J. Horan
Natl. Starch

Huyck Felt Co., division of F. C. Huyck and Sons, Rensselaer, N. Y., has promoted Warren C. Naugler to felt sales engineer for southern New England. Mr. Naugler has served in this area for over seven years as a field service engineer. W. D. Stroud will continue as Huyck's District Sales Manager for New England.

National Starch Products Inc. has named Lawrence J. Horan manager of its Southeastern Division with headquarters in Atlanta, Ga. He will be responsible for overall operation and supervision of the adhesives, paper and textile sales and technical service groups. He will also work on the promotion of specific products for these fields.

Mr. Horan joined National Starch in 1950.

Mason-Neilan, division of Worthington Corp. with headquarters in Norwood, Mass., has announced the establishment of a new instrument sales division with James M. McAlear as manager. He was formerly manager of the Mason-Neilan Pulp and Paper Mill Department.

H. P. Fishwick will be the new head of the Pulp and Paper Mill Department. He previously served as supervisor of sales and service engineering for paper machine drying and drainage systems.

Bulkley Dunton Pulp Co. Inc. and Bulkley Dunton Processes, Inc., are consolidating and assuming the name Bulkley Dunton Pulp Co. Inc., 26 Broadway, New York City, N. Y.

A. E. Staley Manufacturing Co. has appointed Natt K. Hammer to the newly-created position of field sales manager for industrial products of the corn division. He had been assistant manager in industrial sales since 1954.

OBITUARIES

Charles S. Proctor, 92, founder and treasurer of the Proctor Paper Co., Inc., Lowell, Mass. died February 28 at his home.

He was a past president and honorary life member of the Boston Paper Trade Assn. and past president of the New England Paper Merchants.

Eugene F. Duff, 72, died March 11 of a heart attack while on his way home to East Orange, N. J. from the office of Roderick O'Donoghue & Co., pulp and paper mill consulting engineers, in New York City. He had worked as a paper mill engineer for over 50 years, first with the now defunct firm of George F. Hardy and for the past 15 years with O'Donoghue.

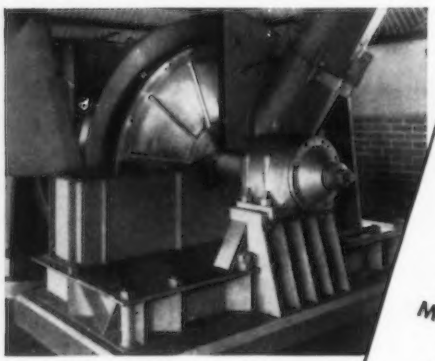
Walter Vinton Wentworth, 94, retired vice president of Penobscot Chemical Fibre Co., died March 8 at his home in Old Town, Maine, after three years' illness.

Following 12 years as superintendent of Ticonderoga Pulp and Paper Co., he became superintendent and manager of mills in Old Town for Penobscot. He was later named vice president, a position he held at his retirement in 1952.

J. Spencer Allen, 61, retired assistant sales manager for Fox Paper Co., died February 20 at his home in Mt. Lookout, Cincinnati, Ohio, suburb.

James C. Weir, 65, a retired sales engineer of the Rice-Barton Corp. of Worcester, Mass died February 24 in Fairlawn hospital, Worcester.

Dan Shelby, 65, died March 11 at a hospital in Fort Smith, Ark. He was a supervisor at the Dixie Cup Co. plant.



Uniform, Clean-Cut CHIPS with Minimum Fines Minimum Bruising Minimum Maintenance

Carthage-Norman Chipper

The unique variable bevel of the knives and helicoidal surfaces of the disc permit the Carthage-Norman chipper to pull the log in at exactly the correct rate for a clean, sharp cut at all points along the cutting edge.

Consequently, at least 70% of the chips are at the specified length, sawdust is up to 1% less (a saving of $15,000 to $30,000 a year), and there is minimum bruising. Maintenance costs on the Carthage-Norman Chipper are exceptionally low.

Write for Bulletin CNC-1

CARTHAGE MACHINE COMPANY CARTHAGE, NEW YORK

CHAS. T. MAIN, INC.
ENGINEERS

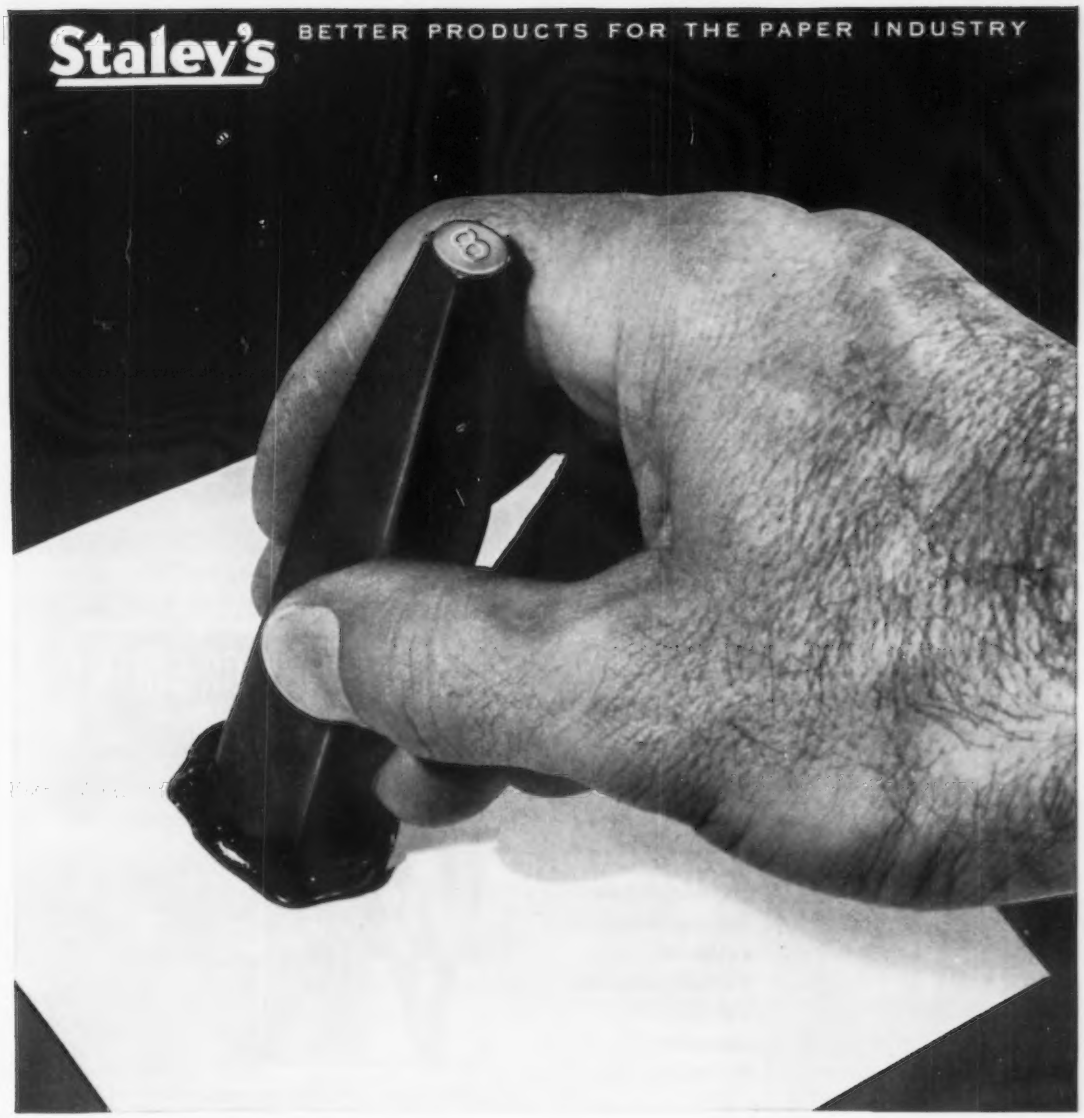
Process Studies, Design, Specifications and Construction Supervision

PULP AND PAPER MILLS

Steam, Hydraulic and Electrical Engineering
Reports, Consultation and Valuations

80 Federal Street Boston 10, Mass.

Staley's BETTER PRODUCTS FOR THE PAPER INDUSTRY



WAX-PICK TESTS PROVE...

Staley's new Stadex® Dextrin 140 gives greater binding strength in higher-solids coating colors

Higher adhesive quality! Now you can use high-solids coatings of low viscosity *without sacrificing surface strength.*

Staley's new improved Stadex Dextrin 140 solves the problem of poor binding strength in high-solids coatings once and for all. Stadex Dextrin 140 is a high-solids clay coating adhesive with excellent stability, viscosity and binding strength characteristics. Used in combination with Stayco® (oxidized) starches, Stadex Dextrin 140 produces a coating of high adhesive quality.

Long a standard in the paper industry, Stadex 140, like all Staley dextrins, is now made by a brand new dextrinization technique that guarantees you even better adhesives of top quality, minimum color and unparalleled uniformity.

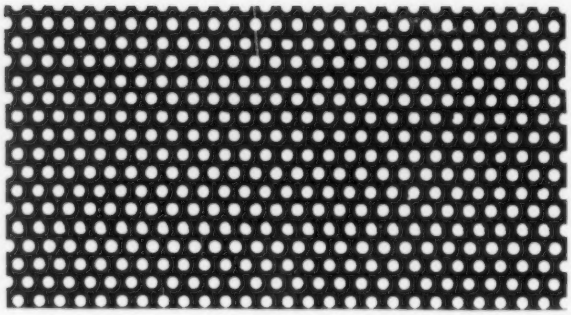
Why not get the full story on Stadex 140 for yourself now?

See your Staley representative or write us for details today.

Staley's®

A. E. Staley Mfg. Co., Decatur, Ill.

Branch Offices: Atlanta · Boston · Chicago · Cleveland · Kansas City
New York · Philadelphia · San Francisco · St. Louis



Perforated Plate is Going Places ... In the Paper Industry!

Paper and pulp mills depend on Hendrick Perforated Plate for tops in filtering and dewatering applications. Clean holes and precision spacing assure excellent draining . . . cut production losses due to blending. Hendrick Perforated Plate is furnished in commercially rolled metals and gauges to meet your specific requirements. For more details, write Hendrick today.

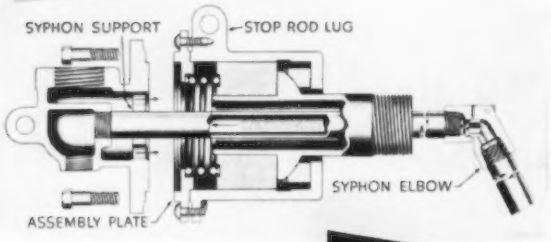
Hendrick MANUFACTURING COMPANY
77 DUNDAFF STREET, CARBONDALE, PA.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Wedge Wire • Architectural Grilles • Miteo Open Steel Flooring—Shur-Site Treads • Armogrids • Hydro Dehazers • Petrochemical Column Internals

---

The right rotary joint for every need!

- . . . ON PAPER MACHINE DRYERS
- . . . CORRUGATORS
- . . . CALENDERS
- . . . ROOFING MACHINES
- . . . WAXERS
- . . . EMBOSSERS
- . . . PRINTING PRESSES

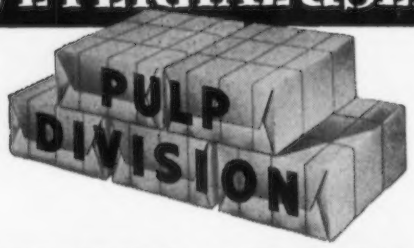


Type "SBP" shown is completely self-supporting. Like all Johnson Joints it has no packing, needs no lubrication or adjustment. The syphon elbow replaces unwieldy curved condensate drainage pipes with two straight pipes, hinges to pass right through the joint. Write for Bulletin S-3002. Johnson Rotary Pressure Joints are available for all operating speeds, pressures, mountings.

Johnson ROTARY PRESSURE Joints *First* in the Paper Industry

THE JOHNSON CORPORATION
828 Wood St., Three Rivers, Mich.

WEYERHAEUSER



BLEACHED SULPHITE
KRAFT CONTAINER BOARD

BLEACHED SULPHATE
BLEACHED KRAFT PAPERBOARD

RAG CUTTERS

FOR ROOFING AND FINE WRITING PAPER MILLS

Capacities
from one to five tons an hour

TAYLOR-STILES and Company
CUTTING MACHINES & KNIVES

10 Bridge Street, Riegelsville, New Jersey

W V Westvaco Quality Papers

Westvaco manufactures a wide range of high quality paper products—from fine printing to rugged converting papers. All of these papers are made from virgin chemical pulps to precise standards of uniformity and quality—Westvaco's guarantee of top performance.

Printing Papers . . . Coated and uncoated letterpress, coated and uncoated offset, and gravure.

Business Papers . . . Bond, mimeo, duplicator, ledger.

Bristols . . . Index, post card.

Converting Papers . . . Label, tablet, envelope, lining, tabulating card, coating raw stock.

Bleached Boards . . . Cup, coated and uncoated carton boards, converting and barrier boards, file folder and tag stock.

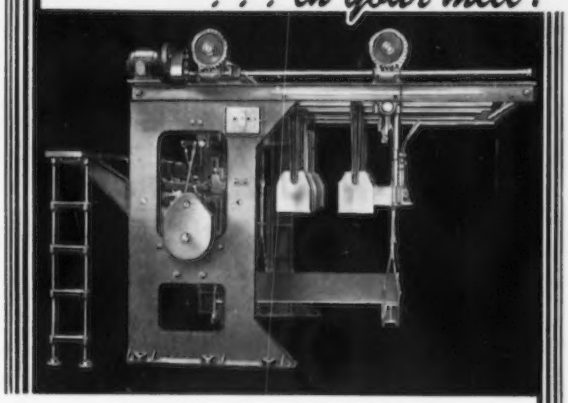
Kraft Papers . . . Bag, multi-wall sack, envelope, asphalting, gumming, interleaving, waxing.

Containerboard . . . Linerboard and corrugating medium.

Market Pulp . . . Bleached and unbleached sulphate.

West Virginia Pulp and Paper Company
230 Park Avenue, New York 17, N. Y.
35 East Wacker Dr., Chicago 1, Ill. • 503 Market St., San Francisco 5, Cal.

You hold the "ACE" ..when you use... HAMBLET LAYBOYS ... in your mill!



Single and Duplex Layboys for finishing room, board and pulp machine application. Supplied with tandem delivery for speeds to 300 feet per minute, overlapping delivery for speeds above 300 feet per minute. Handles tissue, blotting, envelope, and various weights of paper and board.

WRITE FOR CATALOG

HAMBLET MACHINE CO.
LAWRENCE, MASSACHUSETTS

The Papermaker specifies
BOLTON EMERSON TRADE MARK

First Choice in REPLACEMENT TACKLE for all makes, sizes & types of Stock Treating Equipment

- Custom Heat Treated Steel
- Bolton Special Stainless Steel
- Hard Rolled Phosphor Bronze
- Specialized Metallurgy
- Laboratory Services
- Precision Craftsmanship

Contact: **John W. BOLTON & Sons, Inc.**
and
The EMERSON Manufacturing Co., Division
Lawrence, Massachusetts

Restigouche
BLEACHED SULPHITE PULP

for the manufacture of cellophane, rayon and paper products

RESTIGOUCHE COMPANY, Ltd.
Campbellton, N. B., Canada

...F...I...F...E...

the accepted way of spelling
"AUTOMATIC WEB GUIDING"
for catalogue of the only complete line of
COMPLETELY AUTOMATIC WEB GUIDING EQUIPMENT, write:

• FIFE •
MANUFACTURING Company
INCORPORATED
FORMERLY
AUTOMATIC WEB CONTROL MFG. COMPANY

P. O. Box 878 Oklahoma City, Oklahoma

Supplying Your Requirements

CUT COST
USE PULP SUBSTITUTES

WASHINGTON, D. C.
CAMDEN, N. J.
NEW YORK, N. Y.

THOMAS PAPER STOCK COMPANY
1500 No. Hooker Street • Chicago 22, Ill.

PAPER TRADE JOURNAL

CLEARING HOUSE

HELP WANTED—$1.25 a line. Minimum charge $5.00.
SITUATIONS WANTED—$1.25 a line. Minimum charge $5.00. If repeated ½ rate will be charged for each consecutive repetition.

FOR SALE—$1.25 a line. Minimum charge $5.00.
WANTED—$1.25 a line. Minimum charge $5.00.
OPPORTUNITIES—$1.25 a line. Minimum charge $5.00.

Classified advertising space may also be purchased at $7.00 per single column inch. All classified advertisements are payable in advance.

If box number is used—75 cents additional

Address replies to advertisements appearing under Box Number in care of PAPER TRADE JOURNAL, 15 West 47th Street, New York 19, N. Y.

Help Wanted

BETTER POSITIONS

$6000 to $60,000. Want a substantial salary increase, more opportunity or different location? This national 47 year old service connects you with best openings. You pay us only nominal fee for negotiations; This we refund when employer pays placement fee. Present position protected. In complete confidence, write for particulars. R. W. Bixby, Inc., 563 Brisbane Bldg., Buffalo 3, N. Y.

M-24

WANTED: Adjuster for Bag Machine, Film or Paper. Opportunity. Address Box 58-83 care Paper Trade Journal. M-24

Paper Mill Superintendent or Paper Mill Manager

Capable of assuming full responsibility together with adequate authority for the operation of a 3 machine tissue mill operating over speed ranges of 1000-2000 FPM.

Must be familiar with the engineering fundamentals of machinery for production of high speed dry crepe as well as good foundation in the maintenance of such equipment. Salary open. Address Box 58-28 care Paper Trade Journal. TF

ASSISTANT MASTER MECHANIC

EXCELLENT OPPORTUNITY FOR QUALIFIED MAN IN FULLY INTEGRATED MIDDLE ATLANTIC MILL. SUBMIT DETAILED RESUME OF EXPERIENCE AND INDICATE SALARY REQUIREMENTS IN FIRST LETTER.

WRITE BOX 58-74 CARE PAPER TRADE JOURNAL.

M-31

COATING CONSULTANT

Large paper machinery builder in Middlewest desires well qualified coating man to act as coating consultant to the company and to head up coating development program.

Man must have excellent technical background and experience. Salary open—please contact Director of Personnel—Beloit Iron Works, Beloit, Wisconsin.

M-31

PAPER CONVERTING MANAGER

Man needed to lead 75-man department of established paper manufacturer. Knowledge of resin and solvent coating processes and equipment desirable, but not essential. Should be young and aggressive with proven leadership ability. Salary will depend on qualifications. Eastern location. Box #58-78, Care Paper Trade Journal. M-31

Help Wanted

PAPER MEN

$5,000 to $50,000

SALES • PRODUCTION • TECHNICAL

Finding and landing **THE ONE BEST JOB** requires sound analysis, careful planning, proper contacts and skillful negotiation. Paper men ourselves, and the only specialists in the world in our particular field, we assist responsible paper men to accelerate their careers by uncovering and developing **THE SPECIFIC SITUATION** that most exactly fits the needs of each individual we serve. If you seek to better yourself, and your performance to date entitles you to our endorsement, we can and will help you. Contact us in absolute confidence for information regarding procedure.

GEO. M. SUNDAY & ASSO.
PAPER PERSONNEL CONSULTANTS
6 E. Monroe Chicago ANdover 3-1970

PAPER MILL ENGINEER

Qualified to make improvements in the maintenance of paper mill equipment. In reply give education, experience, and salary desired. Mill located in New England. Box No. 58-73 care Paper Trade Journal.

M-31

PAPER CONVERTING MACHINERY DESIGNER

Wanted by manufacturer of paper and film bag machinery and printing presses.

Located in pleasant New Jersey community.

Degree not necessary—only the ability and practical background for independent design of converting machinery.

Excellent opportunity for capable man. Salary open.

Please send resume of experience. Box 58-13 care Paper Trade Journal.

TF

"HELP WANTED"

EXCELLENT TOP WAGES

3—MACHINE TENDERS
3—BACK TENDERS
3—3rd HANDS

Must be experienced on fourdrinier & kraft paper machines.

Mill located in metropolitan area.

Address Box 58-66 care Paper Trade Journal

M-31

Help Wanted

MECHANICAL ENGINEERS

PAPER MILL ENGINEERS OR M.E.'S WITH SOLID EXPERIENCE IN THE PULP AND PAPER INDUSTRY

Wanted for 2 to 5 years service in BRAZIL

Must have good knowledge of PORTUGUESE

This is an unusual opportunity for qualified engineers. A strong background in pulp & paper manufacture is absolutely essential. Send full details, including a résumé and salary requirements, to:

BOX 58-71

c/o PAPER TRADE JOURNAL

Your reply will be treated confidentially.

M-31

EXPANDED OPPORTUNITY FOR ADMINISTRATIVE AND EXECUTIVE PERSONNEL

Leading national manufacturer of packaging materials will employ several superior men with proven managerial experience to participate in management of current operations and assist in aggressive expansion. Successful applicants will work directly with top management as associate or assistant in one or more of several fields, including sales, production, product development and general administration.

Experience in flexible packaging preferred but not essential.

In addition to unique opportunity for personal progress in the growing packaging industry, company offers exceptionally broad retirement benefits plus stock options for key members of management group.

Minimum qualifications:

(A) Proven record of achievement;
(B) Stable employment background;
(C) Minimum current earnings $12,000 per year.

Send full resume and personal history—but only if you meet these qualifications—to Box 58-72 Paper Trade Journal. All replies held in strictest confidence. Interviews with executives promptly arranged. M-31

ROSS PAPER MACHINERY CO.

USED PAPER MAKING AND CONVERTING MACHINERY

265 PASSAIC STREET · NEWARK 4, NEW JERSEY · Humboldt 2-2177

Cable Address: "JACKROSS Newark, NJer"

QUALITY GUARANTEED MACHINERY ERECTED FOR YOUR INSPECTION

BEATERS

1—E. D. Jones "Bertram" 1500 lb. roll 72" x 63", C.I. tub, complete with Foxboro air cylinder control and washer.
1—Valley Iron Wks. 750 lbs. Iron Tub.
6—Dilts Iron Tub. 1500# Bandless rolls.

CALENDER STACKS

1—B & C 72" 7 roll.
1—Lobdell 82"—5 roll.
1—Sandy Hill 84" 7 roll with doctors.
1—Lobdell 86" five roll.
1—B & C 124" 5 roll.
1—B & C 124" 6 roll.
1—Downingtown 128" 7 roll, complete.
1—Farrel 152"—frames for 11 rolls with 5 rolls.

CONVERTING MACHINERY

1—National model AS Auto. metal edger
1—ABC Case Sealer—adjustable.
1—Knowlton 42" Core Cutter, with motor.
1—Knowlton 40" Sheet Gluer.
1—Hudson-Sharp model GL-2 2-ply laminator.
1—Knowlton 60" lap tube roller 4 ply.

CYLINDER MACHINE WET END

1—Dowingtown 99" single cyl. wet end comp. w/18" dia. couch etc.
1—Beloit 7 cyl. 132" wet end comp. Cyl. 36" dia. Couches 18" dia. Includes 4 sets primary & main presses.

CYLINDER MOLDS

1—72" face x 48" diameter.
1—73" face x 48" dia.
1—92" face x 30" dia.
1—102" face x 36" dia.
2—104" face x 36" diameter.
1—107" face & 48" dia.—A.F. brgs
2—111" face x 36" dia.—A.F. brgs.
2—132" face x 36" dia.—A. F. Brgs.
1—132" face x 42" dia.—A. F. Brgs.
1—136" face x 54" dia. stainless steel covering.

DRIVES

46—Inclosed RT. Angle and parallel. Reeves, P.I.V., etc, 2 H.P.—150 H.P.

DRYERS—HYDROSTATICALLY TESTED

2—42" face x 36" dia.
2—44" face x 36" dia.
2—46" face x 16" dia. & accessories.
2—46" face x 36" dia.
40—46" face x 24" dia. chrome plated
58—46" face x 48" dia. chrome plated
1—52" face x 48" dia., gear bearings.
1—67" face x 36" dia.
1—68" face x 36" diameter.
8—72" face x 36" dia. with AF bearings.
1—74" face x 36" dia. Lukenweld—A.F. Brgs.
17—75" face x 36" dia., with gears & brgs.
3—76" face x 36" dia. with gears.
28—80" face x 36" dia. Complete section.
10—80" face x 48" dia., with gears & bearings.
1—82" face x 48" dia., gears & bearings.
2—84" face x 28" dia.
2—88" face x 36" dia.
1—90" face x 18" dia. with A-F bearings.
9—90" face x 48" dia. with gears & bearings.
41—94" face x 48" dia. Complete section.
10—101" x 48" diam. Complete section.
1—104" face x 36" dia.
1—110" face x 42" dia.
1—120" face x 42" dia.
1—130" face x 48" dia.
1—138" face x 36" diameter.
2—160" face x 28" dia. with rope carriers.
10—160" face x 36" dia.
1—160" face x 42" dia.
14—160" face x 48" dia.

EMBOSSERS

1—80" Hudson Sharp A.F. Bearing equipped.

EXTRACTOR ROLLS

1—Downingtown 24" x 134" plain extractor with 18" x 136" R.C. couch roll.

FILTERS

1—Oliver continuous filter, cylinder 8 ft. diameter x 10 ft. face, steel vat. Used 2 months.

FLAT SCREENS

1—Impco 10 Plate—Dunbar drive, bronze vat.
1—12 plate Sandy Hill, Roller Shoe.
7—Beloit 12 plate—Witham Fasteners.
2—IMPCO 12 plate—w/Braemer controls.

JORDANS

1—Appleton #2 anti-friction bearings.
1—Smith & Winchester with granite filling.
1—E. D. Jones #4 (Imperial) with A. F. brg.
1—N & W Mammoth, Jr.
1—N & W Monarch.
1—N & W Bulldog half inch bars.

LABORATORY EQUIPMENT

Valley Iron Wks. pulp test equipment consisting of couch roll, sheet mould, hydraulic press, hot plate with boiler. Like new condition.

MOTORS

1—300 H.P. West. 388 RPM, 440-3-60.
1—GE 350 H.P. syn. 3/60/2200—720 R.P.M.
3—GE 150 H.P. 3/60/440—435 R.P.M.
3—GE 100 H.P. 3/60/440—435 R.P.M.
1—GE 100 H.P. 3/60/440 695 R.P.M.

PULP EQUIPMENT

3—2 ft. x 8 ft. type Tyler screens.
1—Jones pulp screen. Cylinder 40" dia. x 83".

PUMPS

44—Centrifugal Pumps open & closed impellers.
7—Beloit 8" x 10" Fan Pumps.

REELS

1—Kohler 100" 2 arm unwind Reel. Accommodates 60" dia. rolls. Completely automatic. Equipped with splicer. New condition.
1—Bagley Sewall Pope Reel—Drum 150" face x 36" dia. Complete with Reliance Drive.
1—Downingtown 94"—2 bowl—60" rolls.

REFINERS

1—Bauer Model 235 single disc with S.S. discs and 150 HP motor 440/3/60.
1—34" Sutherland disc refiner, late model.
1—24" Downingtown Weiner refiner. New.
1—Diltz classifiner w/spare discs.
1—#1 Clafin Refiner. Anti friction bearing.

ROLL GRINDERS

1—Farrel Birmingham — complete with motor drive. For rolls 30" x 160".

ROLLS—PRESS, COUCH, CALENDER, ETC.

350 misc. rolls. Inquiries invited.
24—153" face x 5" dia. S.S. table rolls.
7—R.C. Couch 18" dia. x 132" face wth brgs.
4—Sets primary presses 12", 14" & 16" dia. x 128" face. Bottom rolls bronze. Top rolls R.C.
1—Set Smoothing Presses, 202" face. Top roll RC 26" dia., Bottom Roll Chrome, 24" dia.
2—98" x 18" Press Section. Complete.

ROTARY SCREENS

1—#2A Bird with copper vats.
12—3A Model 100 Bird S. S. or copper vats.

SHEETERS

1—Kidder 65" Spot Sheeter with elec. eye.
1—Hamblet 72" single knife with layboy.
1—Hamblet 30" with 6 roll backstand.
1—B.C. 80" heavy duty Duplex board cutter.
1—M & W 80" with backstand.
1—82" Hamblet Single Knife with layboy.
1—Hamblet 100" single knife with layboy.
1—Hamblet 110" single knife sheeters.
1—M.&W. 114" Single Knife with Layboy.
1—Cameron 124" quick change slitter assembly.
1—Downingtown 124" h.d. duplex board cutter.
1—Hamblet 87" Duplex w/layboy and overlapper.

SHREDDERS

2—Mitts Merrill air fluff paper shredders.
1—Taylor Stiles giant stock Shredder style 36.

SLITTERS & WINDERS

1—Shultz 12" coreless rewind.
1—Cameron 30" Model 6 w/motor.
1—Fales 40" Model B 1" and 1¼" knives.
1—Essex 42" duplex—30" diameter rewind.
3—Cameron 42" model 6.
1—Cameron 42" Model 40-1A—22" rewind.
1—Hudson Sharp 48" Wax Paper Converter.
1—Cameron 52" Model 24-3A, duplex rewind.
1—Cameron 52" Model 26-7 Duplex.
1—Langston 60" Shear Cut Slitters.
1—Hudson Sharp 60"—for plastic coated papers.
1—Hudson Sharp 60" Wax Paper Converter.
1—Cameron 62" Model 6-30" rewind.
2—Cameron 62" Model 6, 24" rewind.
1—Cameron 62" Model 9-5.
3—Cameron 62" Model 8—heavy duty.
1—Cameron 72" Model 26-2A.
1—Hudson-Sharp 72" high speed automatic.
1—Warren 94" Machine winder—60" rolls.
1—Cameron 92" Model 10-11A, A.F. brgs.
1—Cameron 194" model 19, A.F. brg.

STEAM TURBINE

1—De Laval 100 H.P. Complete incl. reducer,

SUCTION COUCH ROLLS

1—Sandusky 22" diameter x 135" drilled face.
1—Sandusky 18" diameter x 116" drilled face.
1—Sandusky 25" diameter x 122" drilled face.
1—Sandusky 18" diameter x 122" drilled face.
1—Millspaugh 30" diameter x 192" drilled face.

SUCTION PRESS ROLLS

1—Millspaugh 30" dia. x 194" drilled face.
1—Downingtown 112" drilled face x 24" dia.

SUPER CALENDERS

2—Norwood 58", 13 roll glassine stacks.
1—Norwood 80", 10 roll w/motor.

THICKENERS

1—Thickener, Cylinder 92" face x 36" diameter, with R. C. Couch.

TRIMMERS—POWER BACK GAUGES

1—Seybold 45" model 10 Z.
1—Seybold 56" Dayton with motor.
1—Seybold 84"—Dayton with motor.
1—Seybold 50" Precision Model 10-ZD.
1—Seybold 84" Model 12-Z.
1—Sheridan 65" with motor.

VACUUM PUMPS

1—Nash #6 Hytor.
1—Nash #8 Hytor.
1—Connersville 7 x 10.
1—Nash H-8

VOITH INLETS

2—Valley Iron Voith Inlets, 86"—Brass lip.
1—Valley Iron Works inlet—106"
1—New Valley Iron Works 156" x 36" monel lined inlet and head box.
1—Bagley and Sewall 144" stainless steel clad high speed inlet and head box.

YANKEE DRYERS

1—Beloit 10' diameter x 132" face 35 #S.P.
1—Beloit 12' diameter x 140" face 75 #S.P.

WAXERS & COATERS

1—Mayer 65" complete with drive.
2—Mayer 60" complete with motor.
1—Mayer 48" complete with motor.

Help Wanted

SALES/PROJECT ENGINEER

WANTED BY LEADING PULP & PAPER MILL EQUIPMENT MANUFACTURER

To cover export markets; stationed in New York; 3-4 annual foreign trips of 4-5 weeks each. Applicant should have technical/chemical background and experience in pulp and paper mill operations.

Knowledge of foreign languages desirable but not essential.

Please submit complete resume of personal background experience and salary expected to:

Box 58-79
c/o Paper Trade Journal
Replies will be held in confidence

A-7

Situations Wanted

GENERAL MANAGER
ASSISTANT GENERAL MANAGER
or
PLANT MANAGER
for Converting Plant or Paper Mill

A man with successful record in Top Management and Technical phase of paper converting, now available. Age 40, married . . . wide knowledge and acquaintance in industry, desires connection with progressive company where advancement is possible. Excellent references . . . five figure salary required. Address Box 58-75 care Paper Trade Journal.

M-24

Paper Chemist, B.S. degree. 21 years' experience in paper, insulating board, and semi-chemical pulp in research, development, control, and project engineering work. Seeking stable connection with progressive concern. Willing to relocate. Please reply to Box 58-77, c/o Paper Trade Journal.

M-24

MECHANICAL ENGINEER

With 12 years technical and administrative experience in engineering, construction and paper mill operations. Successful and proven record for aggressive engineering application on production problems. Seeks greater opportunity for advancement with an expanding company. Address Box 58-80 care Paper Trade Journal. M-31

Wanted

WANTED: One Potdevin Model 101 Machine
One Potdevin Model 102 Machine
for Flats and Squares.
Address Box 58-82 care Paper Trade Journal
M-31

WANTED

Industrial concern desires to buy the following used paper laboratory equipment if in good condition:

Laboratory Beater, 1½# — preferably a Valley, Noble & Wood or equivalent with weight adjustable roll setting.

Mullen Tester—motor operated.

Tear Tester—Elmendorf.

Please address full particulars to Box 58-84 care Paper Trade Journal.

A-7

WANTED

An Appleton or Emerson #2 Jordan with or without anti-friction bearings. We would also be interested in Emerson #2 OD if available. Write Box 58-70 care Paper Trade Journal. M-24

Patent Service

MICROCARD PATENT SERVICE

Complete specifications of all U. S. and Canadian pulp and paper patents are available on microcards at a yearly subscription rate. Details of the service can be obtained from The Institute of Paper Chemistry, Appleton, Wisconsin. TF

Sales Agency

Agency Representation Available

Old established, incorporated Sales Agency to the Paper Industry desires additional sales connection representing line of mechanical equipment or Paper Machine wires. Territory, Lake States. Box 58-64 care Paper Trade Journal.

M-24

Consulting Service

OPERATING CONSULTING SERVICE

We supply the know how after the erection engineers have completed their work.

Write Box 58-47, care Paper Trade Journal.

M-31

LOOK
through the columns of the
CLEARING HOUSE
You are bound to see
what you need.

BARGAINS

IMMEDIATE DELIVERY

1—66" Holyoke 9-Roll Super Calender Stack, Complete. Rebuilt and used but a short time, in A-1 condition. Drives and Spare Rolls.

1—128" 8-Roll Bagley & Sewall Calender Stack, king roll 24" dia., 4 intermediate rolls 12" dia., top roll 16" dia. Heavy box frames, full set of doctors. Excellent Condition.

26—36" x 76" Complete Dryer Section, Stack, Drives, Etc.

21—48" x 82" Pusey & Jones Dryer Section.

10—48" x 150" Pusey & Jones Dryers.

1—84" Carthage 10-Knife Chipper. Like new, used less than one year.

1—84" Kamyr Machine, Complete, 75 Ton per day output.

1—85" Waxing Machine, includes electrically operated wax tank, 85" Squeeze Press, 2 Chill Rolls, 1 Rewind Reel. Practically brand new 15 H.P. Vilter, Model W-1500FH, Freon Compressor, Induction draft cooling tower and circulation pump, also backstands, M.G. Set for D.C. Motor Drive, Etc. Excellent Condition.

3—No. 1 Jones Refiners, Late Type. A.F. Bearings.

1—E. D. Jones Imperial Jordon, S.S. Filling.

1—Noble & Wood Mammoth Jr. Jordon, S.S. Filling.

1—14 Plate Impco Flat Screen, Dunbar Drive, Bronze Vat. Direct Motor Driven.

1—110" Pusey & Jones 2-Drum Winder. A.F. Bearings.

1—Hudson Sharpe Toilet Tissue Converting Machine. Serial No. 2124. 8 Spare Mandrel Bars.

1—25" Dia. x 156" Sandusky Suction Couch. Complete with Bearings and Stands.

1—Trimbey Senior Rotary Screen.

1—No. 6 Nash Hyator Vacuum Pump.

3—10" x 20" Beloit Triplex Pumps.

1—12" x 20" Beloit Duplex Pump.

1—54" Dia. x 48" Face Valley Iron Tub beater.

2—Impco Rotary Pulp Screens.

2—No. 3 Impco Rotary Knotter Screens. S.S. Plates.

1—Sandy Hill Sulphur Burner, Complete.

5—Press Sections—One each of 76", 82", 84", 110" and 112".

1—Tugboat Annie Pulper.

1—No. 244 Mattison 18" Gore Cutting Saw —5 H.P. 3450 RPM, 3/60/220-440 volt. Complete with Conveyor

1—90 H.P. Terry Turbine. Type G-4000/1000 RPM. For Paper Machine Drive. Complete.

1—No. 2 Jones Pulper. A.F. Bearings, Spare Worm.

1—36" Putman H.D. Lathe—15' Centers.

1—24" x 6' Lodge & Shipley Geared Head, H.D. Machine Lathe, Taper Attachment, Hollow Spindle, Motorized.

Gear Reducers, P.I.V. Drives, Gearmotors, B.B. Pumps, Stock Pumps, Plunger Pumps, Etc. 1000 Electric Motors from ¼ H.P. to 600 H.P. in Stock.

The above is but a small part of the inventory we carry. We can furnish you with almost anything in the line of paper mill, electrical and machine shop equipment.

We also have a large inventory of new and used flanged fittings of all types at very low prices.

Write—Wire—Phone For Your Needs

RUDERMAN MACHINERY EXCHANGE
GOUVERNEUR, NEW YORK
Telephone 333-334

TF

For Sale

FOR SALE

We have just received shipment of the best removable Fourdrinier we have ever seen on the used market and offer same, complete or in part. Replacements cost in excess of $300,000.00.

1—Rice Barton, quick change, Fourdrinier for 232" wire, 80' long which was running 1200 F.P.M. on Feb. 28th. This is in excellent condition with the stainless steel headbox and inlet, with 3 R.C. distributor rolls, all new in 1949. Total weight 60,000±.

1—Breast roll 30" dia., 240" face with antifriction bearings.

18—Rubber covered table rolls, 12" dia., 240" face with antifriction bearings, roll balanced for 1500 F.P.M.

8—Stainless steel Suction boxes with micarta covers

8—Rubber covered wire rolls, 16" dia., 240" face

1—Gilbert Nash wire guide

1—24" dia., 232" face Dandy roll with Sinclair trunion bearings and stands.

Complete frames, stainless steel rails, all designed for quick wire change including turn table. Also stainless steel white water trays, rubber doctor blades, deflectors, etc. All in excellent condition.

If you can use this "as is" fine, if it is too wide we can cut it to your size. This will sell quickly.

Osborne Paper Mill Equipment Corp.

Fulton, N. Y. Phone Lyric 2-4254

M-24

FOR SALE: One (1) Model 4 Potdevin Sack Machine. Excellent Condition. Address Box 58-81 care Paper Trade Journal. A-7

FOR SALE

Unique Reverse Roll Coater capable of applying one to twenty pounds solids per 1,000 sq. ft. Width 31¾", suitable for experimental work or narrow production.

The Jelks Company, Engineers

3000 Princeton Avenue, Middletown, Ohio

M-24

Buy U. S. Savings Bonds

Government Bids

PROPOSALS

FOR FURNISHING

PAPER FOR THE U. S. GOVERNMENT PRINTING OFFICE

SEALED PROPOSALS will be received until 10 a. m., E. S. T., April 7, 1958, in the room of the Joint Committee on Printing, in the Capitol, Washington, D. C., for furnishing the paper for the public printing and binding and blank paper ordered for the Government departments and establishments during the term of 3 months beginning May 1, 1958, deliveries to be f. o. b. Government Printing Office Warehouse, or warehouse siding, Washington, D. C.

The proposals will be opened in the presence of and the award of contracts made by the Joint Committee on Printing to the lowest and best bidders for the interest of the Government whose bids are in conformity with the requirements of the proposal. The committee reserves the right to reject any or all bids, or to accept any bid or any part and reject the other part if, in its opinion, such action would be in the interest of the Government.

Blank proposals containing the instructions, schedule, and specifications, accompanied by standard samples, may be obtained by addressing Raymond Blattenberger, Public Printer, Washington 25, D. C.

ADVERTISEMENT

Contracts will be entered into for supplying the quantities required, whether more or less than the estimates, as provided in paragraph 26 of the Instructions.

The approximate estimated quantities set forth in detail in the schedule comprise:

1,910,000 pounds machine-finish book paper; 30,000 pounds machine-finish book end paper; 85,000 pounds english-finish book paper; 9,482,800 pounds offset book paper; 185,000 pounds antique book paper; 150,000 pounds supercalendered book paper; 1,690,000 pounds coated book paper; 611,500 pounds mimeograph paper; 291,250 pounds duplicator copy paper; 9,415,000 pounds writing paper; 3,875,000 pounds writing paper for offset printing; 2,500 pounds 100% fine writing paper; 573,000 pounds map paper; 370,000 pounds manifold paper; 1,566,000 pounds bond paper; 10,000 pounds 100% bond paper; 35,000 pounds translucent paper; 814,000 pounds ledger paper; 1,092,000 pounds index paper; 340,000 pounds cover paper; 10,000 sheets cloth-lined cover paper; 20,000 pounds manila paper; 240,000 pounds kraft paper; 390,000 sheets gummed paper; 20,000 pounds blotting paper; 8,000 pounds oiled manila tympan paper; 5,000 pounds wallet board; 55,000 pounds manila tag board; 10,000 pounds manila cardboard; 61,000 sheets railroad board; 45,000 pounds wood cardboard; 120,000 pounds tan board; 3,620,000 pounds postal card paper; 45,000 sheets pressboard; 210,000 pounds newsboard;

220,000 {pounds binder's board; pounds chestnut cover board.

By direction of the Joint Committee on Printing.

RAYMOND BLATTENBERGER
Public Printer.

WASHINGTON, D. C.
March 17, 1958.

PRACTICAL PAPER TECHNOLOGY

This book begins with a survey of "Progress in the Paper Industry" and ends with a list of books recommended for collateral reading. The intermediate chapters are entitled: "How to Judge Paper"; "Physical Aspects of Paper"; "Practical Manual and Visual Tests"; "Essential Facts About Papermaking"; "Coated, Glazed and Specialty Papers"; "Permanence of Paper"; "Paper Difficulties in Converting"; "Paper as a Medium for Printing"; "Letterpress Printing"; "Offset Lithography"; "Intaglio Processes."

Also a Supplement containing a Quiz Test on Paper.

Practical Paper Technology

Price $1.75

Foreign Delivery—25c extra

Lockwood Trade Journal Co., Inc.

49 WEST 45th ST.
NEW YORK 36, N. Y.

Send A Copy of
Paper Trade Journal
To Your Friends
Or Fellow Mill Employees
... At No Cost

PAPER TRADE JOURNAL
49 W. 45th St.
N. Y. 36, N. Y.

Please send a free copy with my compliments to the person listed below:

☐ If possible, send ..... Date of Issue

☐ Send the next current issue.

To .....

Home Address .....

City ..... Z.... State.....

Employer .....

Position .....

Sender .....

Home Address .....

Employer .....

Position .....

J. E. SIRRINE CO.
Greenville, South Carolina
Engineers
Established 1903

PAPER & PULP MILLS • WASTE DISPOSAL • TEXTILE MILLS •
APPRAISALS • WATER PLANS • STEAM UTILIZATION •
STEAM POWER PLANTS • HYDRO-ELECTRIC •, REPORTS

BUY U.S. SAVINGS BONDS

PRACTICAL PAPER TECHNOLOGY TO TELL "WHO DUNNIT!"

By William Bond Wheelwright

This book begins with a survey of "Progress in the Paper Industry" and ends with a list of books recommended for collateral reading. The intermediate chapters are entitled: "How to Judge Paper"; "Physical Aspects of Paper"; "Practical Manual and Visual Tests"; "Essential Facts About Papermaking"; "Coated, Glazed and Specialty Papers"; "Permanence of Paper"; "Paper Difficulties in Converting"; "Paper as a Medium for Printing"; "Letterpress Printing"; "Offset Lithography"; "Intaglio Processes."

Also a Supplement containing a Quiz Test on paper.

Practical Paper Technology, Price $1.75. Foreign Delivery—25c extra

Lockwood Trade Journal Co., Inc.

49 WEST 45th ST. NEW YORK 36, N. Y.

INDEX TO ADVERTISERS

PAPER TRADE JOURNAL

A

Adell Chemical Co. ..... —
Albany Felt Co. ..... —
Allied Chemical & Dye Corp. —
Allis-Chalmers Mfg. Co. 29
Aluminum Co. of America ... 48
American Bitumuls & Asphalt Co. ..... —
American Cyanamid Co., Dyes Dept. ..... —
American Cyanamid Co., Organic Chem. Div. ..... —
American Cyanamid Co., Pigments Dept. ..... —
American Paper & Pulp Co. ... 59
American Potash & Chem. Corp. —
American Steel & Wire Co. ... —
Ames Company ..... —
Antara Chemicals, Sales Div. Gen. Aniline & Film Corp. .. —
Apmew, Inc. 59
Appleton Machine Co., The ... —
Appleton Wire Works ..... —
Appleton Wood Products Co. .. —
Armco Drainage & Metal Products ..... —
Armco Steel Corp. ..... —
Armstrong Machine Works .... —
Arnold Hoffman 58
Asten-Hill Mfg. Co. ..... —
Aurora Pump Div., N. Y. Air Brake ..... —

B

Babcock & Wilcox Co. ..... —
Bahr Bros. Mfg. Co. ..... —
Bailey Meter Co. 35
Baltimore & Ohio R. R ..... —
Bauer Bros. Co. 7
Beloit Iron Works Co. Facing 34
Bird Machine Co. 17
Bixby, R. W., Inc. 66
Black-Clawson Co. ...Fourth Cover
Blaw-Knox Company ..... —
Bolton & Sons 65
Borden Co. 50
Bowsher Co., N. P. ..... —
Brandon Sales, Inc. ..... —
Broughton, A. E. & Co. ..... —
Brown Company ..... —
Buckeye Cellulose Corp. ..... —
Buell Engineering Co. ..... —
Buffalo Forge Co. ..... —
Buffalo Pumps, Inc. ...Third Cover

C

Cady E. L., & Co. ..... —
Cambridge Instrument Co. .... —
Cameron Machine Co. ..... —
Capitol Products Corp., Reel Standard Div. ..... —
Carthage Machine Co. 62
Central National Corp. Front Cover
Chicago Bridge & Iron Co. .. —
Ciba Company ..... —
Cities Service Oil Co. ..... —
Clark-Aiken Company ..... —
Classified Advertising ..... —
Clearing House ..... —
Cleveland Crane & Engrg. Co. —
Cleveland Worm & Gear Co. —
Colonial Plastics Mfg. Co. ... 56
Columbia Cellulose ..... —
Columbia-Geneva Steel Div., U. S. Steel Corp. ..... —
Columbia-Southern Chem. Corp. Sub. of Pittsburgh Plate Glass Co. ..... —
Combustion Engrg. Co. ..... —
Consolidated ..... —
Corn Products Sales Co. ..... —
Crane Co. ..... —

D

Davis, Frank H., Co. Inc. ... —
DeZurik Shower Co. ..... —
Diamond Alkali Co. ..... —
Dicalite Div., Great Lakes Carbon Corp. ..... —
Dierks Paper Co. ..... —
Dilts Machine Works ..... —
Dixie Bearings Div. of Bearings, Inc. ..... —
Dodge Mfg. Co. ..... —
Dorr-Oliver ..... —
Dow Chemical Co. ..... —
Dow Corning Corp. ..... —
Dowell, Inc. ..... —
Draper Bros. Co. ..... —
Dryden Paper Co. Ltd. ..... —
du Pont, E. I., de Nemours & Co. Dyestuffs Dept. ..... —
du Pont, E. I., de Nemours & Co., Electrochemical Dept. Facing 26
du Pont, E. I., de Nemours & Co., Pigments Dept. ..... —

E

East Texas Pulp & Paper Co. —
Eaton Manufacturing Co. ... —
Ebasco Services, Inc. ..... —
Egan Frank W., & Co. ..... —
Elixman Paper Core Co. ..... —
Elliott Company ..... —
Elwell Parker Elec. Co. ..... —
English China Clays Sales Corp. —

F

FabriValve Company ..... —
Fairbanks, Morse & Co. 46
Falk Corporation ..... —
Farrel-Birmingham Co., Inc. ... —
Ferguson, A. K. ..... —
Fife Manufacturing Co. 65
Fitchburg Screen Plate Co. ... —
Foxboro Co. ..... —
Frederick Iron & Steel Co. ... —
Freeport Sulphur Co. ..... —

G

Gates Rubber Company ..... —
Garden City Fan Co. ..... —
Garlock Packing Co. ..... —
Geigy Dyestuffs Div., Geigy Chemicals Corp. ..... —
General Dyestuffs Co. ..... —
General Electric Co. ..... —
General Tire & Rubber Co. ... —
Gibbs-Brower Co. ..... —
Gilbert & Nash Co. 23
Glidden Company ..... —
Goodrich Industrial Prod. Co. .. 3
Goodyear Tire & Rubber Co. —
Gottesman & Co. .....Front Cover
Graton & Knight Co. ..... —
Graver Tank & Mfg. Co. ..... —
Grinnell Co., The ..... —
Gulf Oil Corporation ..... —
Gulf States Paper Corp. ..... —
Gurley, W. & L. E. ..... —

H

Hagan Chemicals & Controls Corp. ..... —
Hamblet Machine Co. 65
Handling Devices Co. ..... —
Harbison-Walker Refractories . —
Harris-Seybold ..... —
Hendrick Mfg. Co. 64
Hercules Powder Co. ..... —
Hooker Electrochemical Co. Facing ..... —
Huber, J. M., Corp. 6
Hudson Sharp Machine Co. ... 49
Hungerford & Terry, Inc. ..... —
Huyck, F. C. & Sons .....36 & 37

I

Improved Machinery, Inc. .... —
Ingersoll-Rand Co. ..... —
International Wire Works .... —

J

Jenkins Brothers ..... —
Johns-Manville Corp. ..Facing 19
Johnson Corp. The 64
Johnson, Alvin H., & Co. 64
Jones, E. D., & Sons Co. ....8 & 9

K

Kalamazoo Tank & Silo Co. ... —
Kamyr Inc. ..... —
Kidder Press Co. ..... —
Knox Woolen Co. ..... —
Koppers Company 38

L

Langston, Samuel M., Co. .... —
Link-Belt Co. ..... —
Lockport Felt Co. ..... —
Lockwood Greene Engineers .. —
Lodding Engineering ..... —
L. O. F. Glass Fibres Co. ... —
Lukens Steel Co. ..... —
Lummus Cotton Gin Co. ..... —
Lunkenheimer Co. ..... —
Lyddon & Co. ..... —

M

Magnus Metal Co. ..... —
Magnaflux Corp. ..... —
Main, Charles T., Inc. 62
Manchester Machine Co. ..... —
Master Builders Co. ..... —
Mead Pulp Sales, Inc. ..... —
Merrick Scale Co. ..... —
Minneapolis-Honeywell Mixing Equipment Co. 14
Monsanto Chemical Co. Plastics Div. 60
Moore & White Co. ..... —
Morden Machines Co. ..... —
Mt. Hope Mchy. Co. ..... —
Mt. Vernon Mills Inc. ..... —
Murray, D. J., Mfg. Co. ..... —

N

Nash Engineering Co. ..... —
National Aluminate Co. ..... —
National Lead Co., Magnus Metal Div. ..... —
National Starch Products, Inc. 22
National Tube Div., U. S. Steel Corp. ..... —
Nelson Company ..... —
New Jersey Zinc Co. ..... —
Nichols Eng. & Research Corp. —
Noble & Wood Mch. Co. ..... —
Nopco Chemical Co. ..... —
Northeastern Paper Sales ..... —
Northwest Paper Co. ..... —
Norton Co. ..... —

O

Oakite Products, Inc. 34
Ohio Injector Co. ..... —
Osborne Paper Mill Equipt. Corp. 69
Orrfoit Co. ..... —

P

Paper Converting Machine Co. —
Parsons & Whittemore 45
Patterson Fd. & Mch. Co. ..... —
Penick & Ford, Ltd. ..... —
Pennsalt Chemicals Corp. ... —
Perkins, B. F., & Sons, Inc. .. —
Perkins Goodwin Co. ..... —
Personnel Service Associates .. —
Pioneer Paper Stock Co. ..... —
Pittsburgh Piping & Equip. .. —
Poirier Control Co. 61
Potdevin Machine Co. ..... —
Powell Valves ..... —
Price P. Pierce, Ltd. ..... —

R

Railway Supply & Mfg. Co. ... —
Raymond, Chas. P. Service, Inc. ..... —
Rayonier, Inc. ..... —
Read Standard Div., of Capitol Products Corp. 39
Record Fdy. & Mch. Co. ..... —
Red Ray Mfg. Co. ..... —
Restigouche Corp. 65
Rice Barton Corp. ..... —
Riedel, Gus & Son ..... —
Riegel Paper Corp. ..... —
Rohm & Haas Co. ..... —
Ronningen-Petter Co. ..... —
Roots-Connersville Blower Div. —
Roosevelt Paper Co. ..... —
Ross, J. J. Co. ..... —
Ross-Midwest Fulton Co. ..... —
Ross Paper Machinery Co. ... 67
Ruderman Machy. Exchange ... 68
Rust Engineering Co. ..... —
Ryerson, Jos. T. & Son ..... —

S

Sandoz Inc. ..... —
Sandy Hill Iron & Brass Works ..... —
Scapa Dyers Inc. ..... —
Seaboard Air Line R. R. Co. —
Shartle Div., Black-Clawson Co. ..... —
Shawinigan Resins Corp. .... —
Sheffield Corp. ..... —
Shell Chemical Corp. 45
Shuler & Benninghofen 11
Signode Steel Strapping Co. .. —
Simplex Wire & Cable Co. .... —
Sirrine, J. E., Co. 69
Smidth, F. L., & Co. ..... —
Soderhamn Mch. Mfg. Co. .... —
Sonoco Products Co. ..... —
Southworth Machine Co. ..... —
Spraying Systems Co. ..... —
Sprout Waldron & Co. ..... —
Stadler Hurter & Co. ..... —
Stalev Mfg. Company 63
Stanley Works ..... —
Stebbins Engrg. Co. ..... —
Stein, Hall & Co. ..... —
Stone & Webster Engrg. Corp. —
Stowe-Woodward, Inc. ..... —
St. Regis Paper Co. ..... —
Sunday, Geo. M., Assoc. 66
Swenson Evaporator Co. ..... —
Swepco Tube Corp. ..... —

T

Taylor Instrument Co.s ..... —
Taylor Stiles & Co. 64
Tennessee Coal & Iron Co. .. —
Tennessee Corp. ..... —
Testing Machines ..... —
Texas Co. ..... —
Texas Gulf Sulphur Co. ..... —
Thiele Kaolin Co. 10
Thomas Paper Stock Co. 65
Titanium Pigment Corp. ..... —
Toledo Scale Corp. ..... —
Torrington Co. 43
Towmotor Corp. 25
Trent Tube Co. 4
Turner Halsey Co. ..... —
Tyer Rubber Co. ..... —

U

United Carbon Co., Inc. ..... —
United Engrg. & Fdy. Co. .... —
United Paper Machinery Corp. —
U. S. Industrial Chem. Co., Div. of National Distillers & Chem. Corp. ..... —
U. S. Rubber Company Second Cover
United States Steel Export ... —
United States Steel Supply Co. —
U. S. Steel Corp. ..... —

V

Valley Iron Works ..... —
Vanderbilt, R. T., Co. ..... —
Virginia Smelting Co. 24

W

Waldron, John, Corp. ..... —
Wallace & Tiernan Inc. ..... —
Walworth Co. ..... —
Weber, H. C., & Co. ..... —
West End Chemical Div. Stauffer Chem. Co. ..... —
Westvaco Chlor-Alkali Div., Food Mchy. & Chem. Corp. —
Westinghouse Elec. Corp. .... —
West Virginia Pulp & Paper Co. 64
Weyerhaeuser Timber Co. 64
Whiting Corp. ..... —
Wiggins Teape & Alex Pirie —
Williams Apparatus Co. ..... —
Williams-Gray Co. ..... —
Wisconsin Wire Works ..... —
Worthington Corp. ..... —
Wyandotte Chem. Corp. ..... —
Wyatt Metal & Boiler Works —

Y

Yale & Towne Mfg. Co. ..... —
Yarnall-Waring Co. ..... —

Z

Zellstofffabrik Waldhof 57

While we strive for accuracy in preparing the above index which is purely a service to our readers, we cannot be responsible for errors.

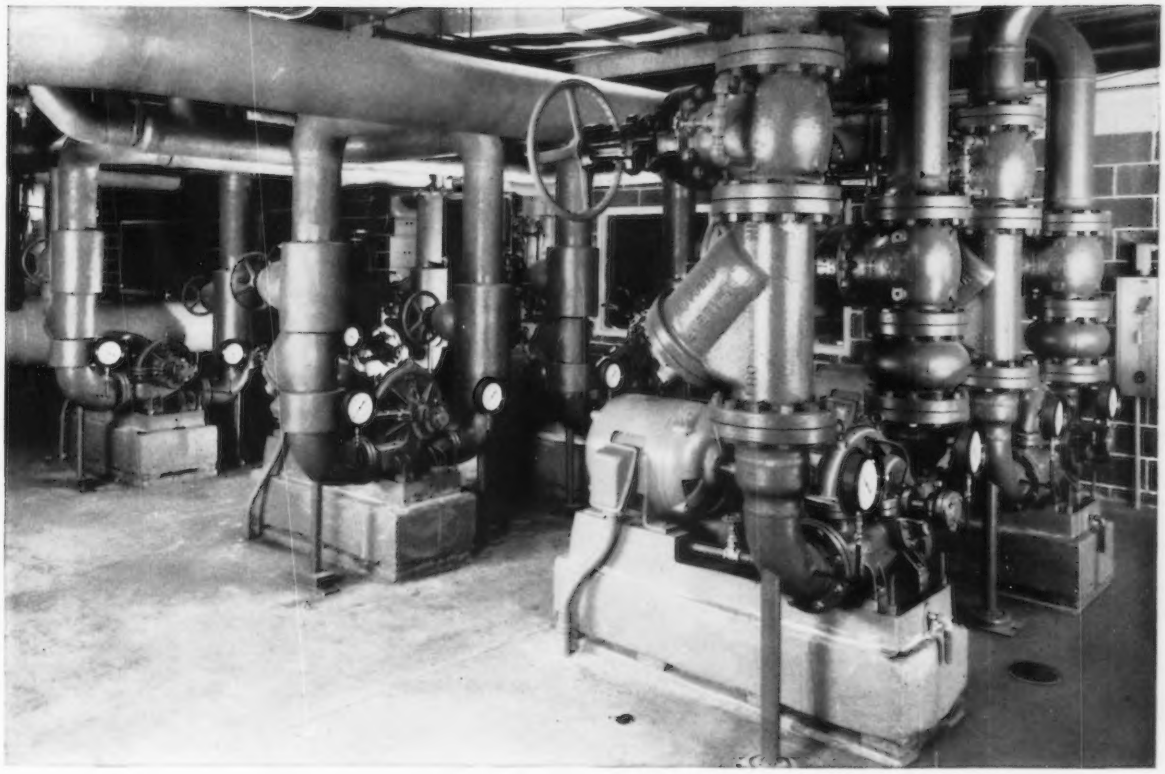
BUSINESS STAFF

Arthur E. Gordon, Business Mgr.
Francis J. Gordon
49 West 45th Street, New York 36, N. Y. Plaza 7-2370
H. K. Vinton
CHICAGO 3, ILL.: Room 1020, 79 West Monroe St. CEntral 6-2784

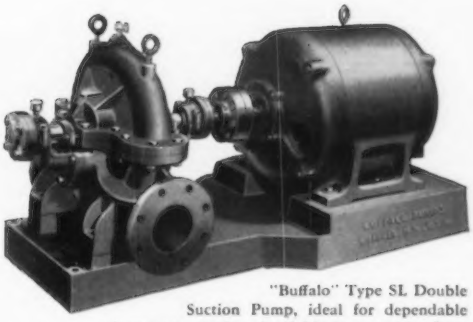
Frederick B. Grosse Production Mgr.
Alrick Man
49 West 45th Street, New York 36, N. Y. Plaza 7-2370
H. L. Poulton
PITTSBURGH, 11, PA.: 610 Pennridge Road. Hemlock 1-1571

McDonald-Thompson Company
SAN FRANCISCO, CAL.: 625 Market St. YUkon 6-0647
DENVER, 2, COLO.: 222 Colorado Nat'l Bank Bldg. KEystone 4-4669
PORTLAND, 1, ORE.: 912 S. W. Market St. CA 2-5146
HOUSTON, 6, TEXAS: Room 214, 3217 Montrose Blvd. JAckson 9-6711
MIAMI, FLORIDA: Hal Moore, Printup & Assoc., 1006 Langford Bldg. Phone:—FRanklin 9-2668, Herbert Morgenbesser Kohlgarten 3
LOS ANGELES, 5, CAL.: 3727 West Sixth Street. DUnkirk 7-5391
SEATTLE, 4, WASH.: 1008 Western Ave. MA 3-766
TULSA 4, OKLAHOMA: 2010 So. Utica RIverside 3-1981
Hamburg—F. U., Germany
Publishing & Distributing Co., Ltd. 177 Regent Street London W 1, England

HUGHES PRINTING CO.
EAST STROUDSBURG, PA.



Here's high efficiency, low maintenance pumping

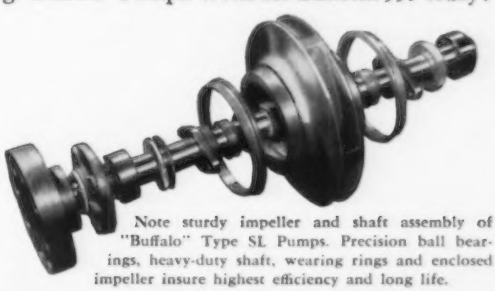


"Buffalo" Type SL Double Suction Pump, ideal for dependable clear water service. Available in capacities from 10 to 14,000 GPM.

Few industries rely as heavily on pumps as the paper industry. For this reason, many paper mills in this country depend on Buffalo Pumps for high efficiency, low maintenance service. Combining 81 years experience with modern construction, Buffalo Pumps offer many advantages to the busy mill man.

For example, in clear and white water service, "Buffalo" Type SL Double Suction Pumps such as those shown above assure you this longer lifespan of reliable performance. Their smooth hydraulic balance and high efficiency are the result of ample water passages, expertly engineered impellers and overall rugged construction.

Profit by the low maintenance service you will enjoy by specifying "Buffalo" Pumps. Write for Bulletin 995 today!



Note sturdy impeller and shaft assembly of "Buffalo" Type SL Pumps. Precision ball bearings, heavy-duty shaft, wearing rings and enclosed impeller insure highest efficiency and long life.

BUFFALO PUMPS

Division of Buffalo Forge Co.

159 Mortimer Street • Buffalo, N. Y.

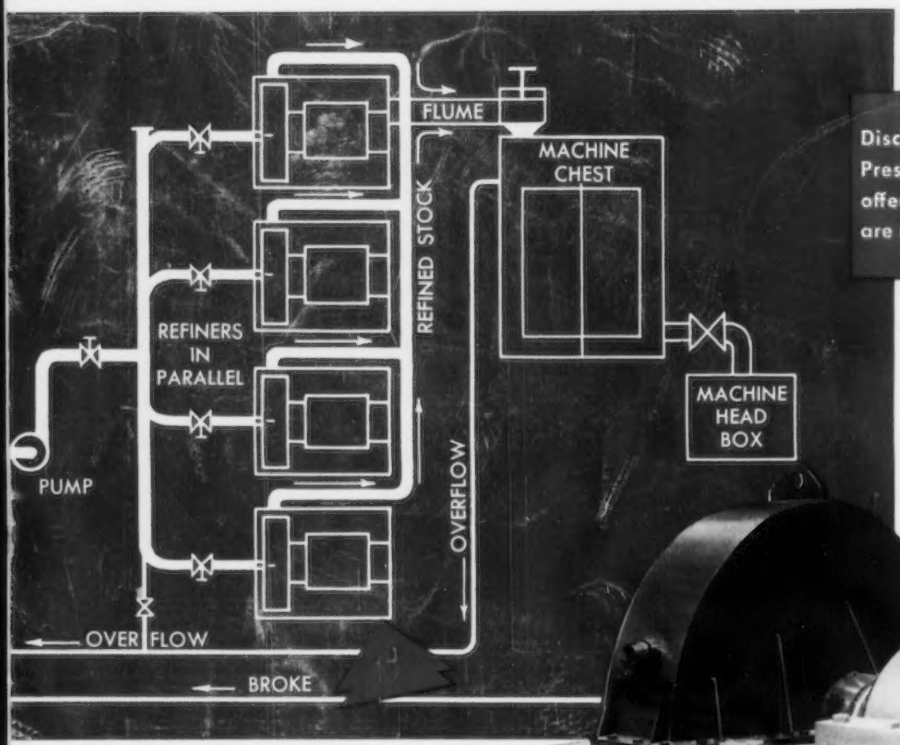
Canada Pumps, Ltd. • Kitchener, Ont.

Sales Representatives in All Principal Cities

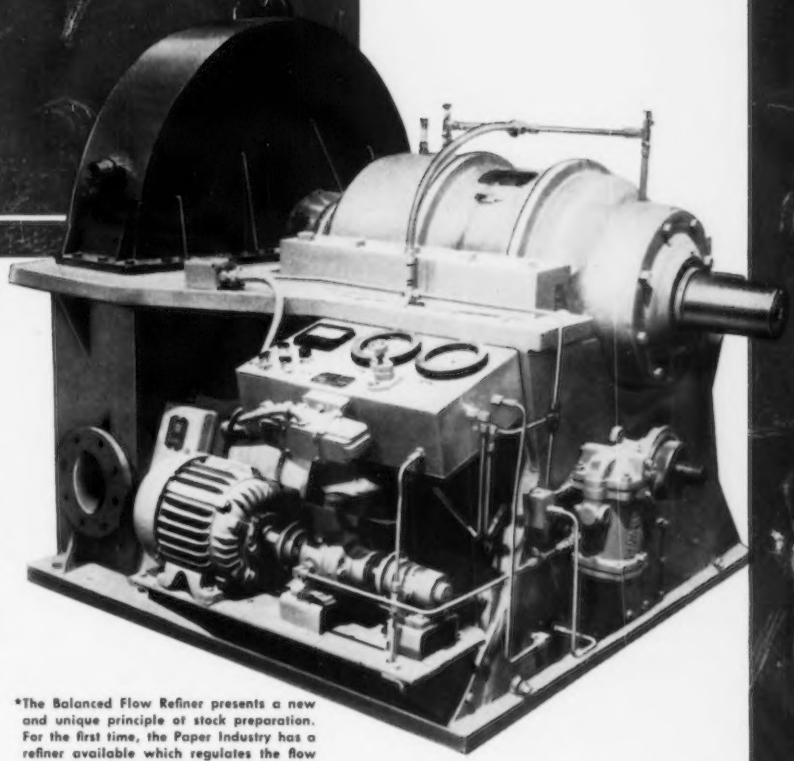
A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

SUTHERLAND REFINERS DEVELOP MAXIMUM PULP QUALITY

- HIGHER REFINING EFFICIENCY
- LOWER OPERATING COSTS
- REDUCED POWER REQUIREMENTS
- FULLY PRESSURIZED OPERATION



Disc Refiners, Breaker Traps and Pressure Washing Systems formerly offered by Sutherland Refiner Corp., are now products of Black-Clawson.



CONTROLLED REFINING TREATMENT for *HIGHEST QUALITY*

It's possible to develop the maximum inherent qualities of any pulp—but the big problem is to do it economically and competitively.

The economical solution to this problem is the Sutherland Disc Refiner. Proved in mill applications for more than twenty years on all types of pulp, paper and board furnishes. Over 600 in use.

A single rotating disc, the result of long careful study and comparison, permits fine adjustment—controlled refining treatment. The balanced flow* principle provides for maximum flexibility and uniformity resulting in consistently high stock quality.

Low cost operation and maintenance are insured by long disc life and quick disc change when needed.

Get complete details on controlled refining—write or phone today.

*The Balanced Flow Refiner presents a new and unique principle of stock preparation. For the first time, the Paper Industry has a refiner available which regulates the flow of pulp suspension between the discs and maintains this flow in a state of balance.

THE BLACK-CLAWSON COMPANY

SHARTLE DIVISION, MIDDLETOWN, OHIO